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NATURAL RESOURCES OF QUEBEC

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Natural Resources of Quebec

DEPARTMENT OF THE INTERIOR
Canada
HON. CHARLES STEWART, *Minister* W. W. CORY, C.M.G., *Deputy Minister*

NATURAL RESOURCES INTELLIGENCE SERVICE
F. C. C. LYNCH, *Superintendent*
OTTAWA: 1923

FOREWORD

MR. F. C. C. LYNCH,
SUPERINTENDENT, NATURAL RESOURCES
INTELLIGENCE SERVICE.

While, in literature as well as in science, it cannot be disputed that there is nothing new under the sun, the volume submitted herewith on the "Natural Resources of Quebec" is, in a special sense, a compilation as distinct from an original production. The undersigned, therefore, looks upon himself as an editor and compiler rather than an author, and wishes gratefully to acknowledge his indebtedness to the various sources from which material has been drawn in the composition of the report. A considerable portion of the material utilized, has been gleaned from official reports of the Dominion and the Quebec governments, and thanks are due the officials of these bodies for the unfailing courtesy with which all requests for information were met. Special mention should be made of the assistance given by Mr. E. T. D. Chambers of the Quebec Department of Colonization, Mines and Fisheries, and by Mr. H. S. Philpot of the Natural Resources Intelligence Service. Manuscripts were vised and proofs read by several of the departments of the Quebec Government and a number of the photographs used for illustrations were kindly supplied by the Department of Trade and Commerce.

No claim is made that the report is exhaustive: the subject is too large for that. It is hoped, however, that by assembling between the covers of a single volume a great deal of useful information heretofore to be had only from numerous scattered sources, it will have justified the effort spent, and will prove of value to business men, prospective settlers, capitalists and others who have much to gain by a more intimate acquaintance with this picturesque and wealthy Canadian province.

M. J. PATTON,
ECONOMIST.

OTTAWA, CANADA,
Nov. 9, 1923.

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TYPICAL RURAL SCENE, EASTERN TOWNSHIPS, QUEBEC

This view of Upper Melbourne, looking north from Richmond, is characteristic of the pastoral beauty and agricultural wealth of this inviting region.

NATURAL RESOURCES OF QUEBEC

CHAPTER I

A Province Old in Story

THE story of the early years of the province of Quebec is rich in the romance of history. The record starts with the year 1534, when Jacques Cartier, starting from Brittany in his search for Cathay, passed through the straits of Belle Isle and sailed as far as Anticosti before his return. Next year he anchored opposite this island in a small bay, to which he gave the name St. Lawrence, which has since extended to the gulf and river. Continuing his voyage past the island of Bacchus (island of Orléans), he penetrated as far as the Indian settlement of Hochelaga (Montreal), returned to Stadacona (Quebec) for the winter, and on May 3, 1536, before weighing anchor for France, planted there a cross bearing a shield with the lilies of France and a scroll claiming the land for Francis I, his king.

EARLY FRENCH EXPLORERS

Nothing lasting, however, was accomplished for more than half a century, when Samuel de Champlain, the resourceful mariner and soldier, whose imagination pierced the isthmus of Panama three hundred years before the steam shovel, founded Quebec on July 3, 1608, the birthday of the Canadian nation. As the first explorer to ascend the Ottawa river and return west from Georgian bay by the route of the Trent canal, as the discoverer of lake Champlain, as the first governor of New France after the three years' occupation of Quebec by Kirke, and as the devoted servant of Henry IV and Richelieu, who by honest perseverance opened Canada to fur-trader, agriculturist, and missionary, he has left a record that cannot pass away.

In the years that came between the death of Champlain in 1635 and the close of the century which saw the death of the great governor Frontenac, the chief events were the founding of the mission at Montreal (1642) in the teeth of the Iroquois by Maisonneuve; the grant of a charter to the Hudson's Bay Company by Charles II in 1670, at the suggestion of the famous renegades Groseilliers and Radisson, known also as the first white men to round lake Superior; the arrival of the several detachments of the Carignan-Salières regiment; the defeat of Sir William Phips in his

futile attack on Quebec in 1690; and the impetus given to colonization and industry by Jean Talon, the energetic agent of Colbert and Louis XIV. In this period, also, the Jesuit Albanel reached the shores of James bay, Joliet and Marquette the river Arkansas, and La Salle followed the Mississippi to its mouths.

THE SEVEN YEARS' WAR

So far, all initiative in Canadian enterprise had come from Quebec and Paris. The Treaty of Utrecht in 1713, which ended a half century of desultory warfare, finally gave to Britain the Hudson's Bay Territory and Acadia, but the government at Quebec still kept control of the St. Lawrence from the Atlantic to the farther end of the Great Lakes, and had in mind to hem in the English colonies by a chain of forts, extending from Louisburg, through Ohio and down the Mississippi, to New Orleans. This design was frustrated by the Seven Years' War (1756-1763). The issue was decided by the destruction of Louisburg and the battle of the Plains of Abraham, but not before the scales of fortune had again been made to waver at Sainte Foy.

RELICS OF FEUDAL FRANCE

From 1759, Quebec province has a history apart from that of France. The Quebec Act of 1774, the Magna Charta of French Canadians, which held Quebec loyal to Britain in 1775, once and for all determined the status of the province and saved from submergence the characteristics which give to it distinction and charm. What was once New France is, in some respects, older than the France of to-day; relics of old French survive in the language of the French-Canadian farmer; the lay-out of the old seigniories accords with that of pre-revolutionary or feudal France, and to this day, in certain nooks of the province, names occur in the folk-songs that are often echoes from the lips of the troubadours of Provençe.

Notwithstanding the immigration of the exiled Loyalists into the Eastern Townships, or the growth of the British population in Montreal and the welcome influx of British and American enterprise and capital which have so much added to the prosperity of the province, Quebec still maintains her national unity. The misnomer of "Lower Canada" in the Constitutional Act of 1791, and in the Act of Union of 1841, was replaced by the proper term "Quebec" in the British North America Act of 1867. Under her own old name, she is one of a family of nine sisters, steady and contented, safely guarding her constitutional rights, and now in the morning of a vigourous development of her unbounded resources.

CHAPTER II

The Land and the People: Some Introductory Facts

QUEBEC is a quaint, new-old province. Its modern cities, metropolitan in character and bustling with the energy of commerce, are in striking contrast to the quiet, thrifty existence of the *habitant* on his ancestral acres; and the new pioneer agricultural areas of the north and west stand out in relief against the older rural districts adjacent to the St. Lawrence, settled and tilled since the time of the early French explorers. With its immense wealth in natural resources, its thrifty law-and-order-loving people and its laws respectful of individual liberty and initiative, it appeals to the capitalist and the business man, as well as to the agriculturist and artisan, of other countries, faring forth into new and more prolific fields of endeavour.

PHYSICAL FEATURES

The Largest Province.—The largest of all the Canadian provinces,* it extends from the frigid sub-arctic regions of Ungava to the more tem-

MONTREAL FROM THE MOUNTAIN
The St. Lawrence river in the background.

perate area of the Ottawa. The province is shaped like a pear, the large end to the north. The eastern side is washed by the Atlantic ocean, into

*Quebec has a land and water area of 706,834 sq. miles.

which flows the St. Lawrence river system, a great navigable waterway penetrating through the province of Quebec into the very heart of the continent to the head of lake Superior, a distance of 2,340 miles. From the earliest times the St. Lawrence has been Canada's great artery of commerce. Upon it are located the two largest cities of the province, Montreal and Quebec, and from its shores settlement has penetrated toward the interior.

Older Settled Portions.—That portion of the province south of the St. Lawrence river may be divided, for purposes of description, into two parts, viz., the area north-east of Quebec city including the Gaspé peninsula and that portion south of the city of Quebec known as the Eastern Townships. The Gaspé peninsula is a picturesque, mountainous country into which the Appalachian mountains thrust a spur from the United States. Its chief industries are lumbering, fishing and, to a certain limited extent, agriculture, where the nature of the country permits. It is rich in game and its streams abound in game fish. Many wealthy Americans and Canadians have fish and game preserves in this district. The Eastern Townships are one of the oldest-settled areas of the province and were largely settled by English-speaking people after the British occupation in 1763. There are proportionately more English-speaking people in this portion of Quebec to-day than in any other. The land is fertile and well suited to farming, and some of the finest farms in Canada are to be found there. Scattered through the Eastern Townships are a number of small but thriving manufacturing towns, supplied with hydro-electric power from the great Shawinigan Falls developments on the St. Maurice river and from smaller local water-power plants. Cheap power and a plentiful labour supply make this one of the most inviting districts in the province to the prospective manufacturer.

The north shore of the St. Lawrence river from the Saguenay eastward is for the most part a "stern and rock-bound coast," but from the Saguenay westward there extends a narrow strip of fertile and well-settled agricultural territory. The valley of the Ottawa is also a productive agricultural area. To the north of this strip, bordering the northern shores of the St. Lawrence and Ottawa rivers, lies the extensive and picturesque Laurentian plateau, with its forest-clad mountains and its clear, sparkling lakes and rivers.

The Beautiful Laurentian Plateau.—"The striking features of the Laurentian plateau are innumerable lakes, large and small, with intervening rounded rocky elevations, wooded, in their natural conditions to the south, rising above the tree line to the northward; while in the far north, on both sides of Hudson bay, hills and valleys become eventually characterized by grasses, mosses and lichens alone, constituting the great "barren lands" of North America. The rivers and lakes are everywhere well stocked with fish, while deer and moose in the southern parts, and to the north the

caribou, abound wherever the Indian hunters have not followed them too closely. Thus, where the region can be entered without undue difficulty, it has already become a much favoured resort of the sportsman.

"Although it is appropriate to describe this region as a plateau or table-land, such terms, it must be understood, are applicable only in a very general way. Its average elevation of about 1,500 feet is notably greater than that of the adjacent lands, and is maintained with considerable regularity, but its surface is nearly everywhere hummocky or undulating. Away from its borders, the streams draining it are, as a rule, extremely irregular and tortuous, flowing from lake to lake in almost every direction; but assuming more direct and rapid courses in deeply cut valleys as they eventually leave it."*

Extending as it does to the northermost and westermost boundaries of the province, "in geographical extent it is thus very important, although somewhat monotonous in its physical and geological features. It contributes little to the fertile areas of the country in proportion to its size, but in the aggregate, comprises a considerable amount of land which is either cultivated or susceptible of cultivation. Elsewhere, in its southern parts, it carries forests of great value, and its mineral resources are already known in some places to be very important. It constitutes, moreover, a gathering ground for many large and almost innumerable small rivers and streams, which, in the sources of power they offer in their descent to the lower adjacent levels, are likely to prove, in the near future, of greater and more permanent value to the industries of the country than an extensive coal field. Particularly notable from this point of view is the long series of available water-powers which runs from the strait of Belle Isle nearly to the head of lake Superior, coincident with the southern border of the plateau."*

WATERWAYS

The St. Lawrence System.—The province is particularly favoured in its waterways. Foremost in this regard is the St. Lawrence river, navigable for large ocean liners as far up as Montreal, approximately 1,000 miles from the ocean, during seven and a half months in the year. It furnishes an outlet for the commerce of central Canada. Quebec is a port of call for ocean liners going to Montreal and the point of debarkation for emigrants from Great Britain and Europe. Montreal is one of the great ports of the world, standing first as a grain-handling port and in point of foreign trade being second on the North American continent only to New York. Approximately one-third of Canada's exports and imports pass through it yearly. It has the most modern facilities for handling grain and other cargoes, and provides 16 miles of waterfront on each side of the St. Lawrence with dockage capable of accommodating over 100 ocean vessels. An electric belt-line railway 58 miles in length connected with the large steam railway lines serves the entire water front. The

*George M. Dawson, C.M.G., F.R.S. in *The Physical Geography and Geology of Canada.*

development of the port has been carried out at a cost of $35,000,000, and is in charge of a Board of Harbour Commissioners appointed by the Dominion Government. Four large terminal grain elevators, with a combined capacity of 12,162,000 bushels, are operated by the Harbour Commissioners. Since 1881, when the Government took charge of the deepening of the St. Lawrence, the depth of the waterway leading to Montreal has been increased from 10 feet to 35 feet.

Lumber-Driving Rivers.—Many of the tributaries of the St. Lawrence from the Laurentian plateau to the north are useful in floating logs, lumber and pulpwood to mills and to market. The more important of these lumber-driving streams are the Ottawa, which forms a large portion of the boundary between Quebec and Ontario, the St. Maurice which taps a country very rich in lumber and pulpwood, and the Saguenay. The Ottawa is a large river navigable by river steamers from Montreal to the city of Ottawa by the aid of locks at Ste. Anne, Grenville and Carillon. The country tributary to it was once very rich in lumber but the best of this is now cut over. The St. Maurice, whose waters are impounded and regulated by the mammoth Gouin dam, produces a large amount of water-power and as a result the district around Three Rivers, where it empties into the St. Lawrence, is becoming a thriving manufacturing centre. The Saguenay is also an important lumber-driving river. It is very deep and is navigable for over 60 miles from its mouth. Its high fiord-like banks of rock and its deep dark waters add to the grandeur of the imposing scenery for which it is noted.

The Richelieu Waterway.—The Richelieu river waterway passes through the Eastern Townships to lake Champlain in the state of New York. This system, commencing at Sorel on the St. Lawrence, extends along the Richelieu river, through the St. Ours lock, to Chambly basin, thence by the Chambly canal to St. John's and up the river Richelieu to lake Champlain. From there, connection is made by the Hudson river system with the city of New York. The waterway, which has a minimum depth of 6 feet 6 inches, is of local importance only.

RAILWAYS

New Areas Opened Up.—The National Transcontinental railway (now part of the Canadian National System) running from Quebec to Winnipeg has penetrated the southern portion of the Laurentian plateau and opened up a number of settlement areas not without promise. The advent of this railway will also, it is expected, result in considerable mining activity. This portion of Quebec is timbered principally with spruce and balsam, the two most valuable pulpwood species, and the settler here possesses the advantage of being able to sell as pulpwood the trees he cuts

VIEW OF MONTREAL HARBOUR SHOWING HUGE GRAIN ELEVATORS

Montreal is the largest grain-exporting port in the world and in point of foreign commerce ranks second in North America. Elevator capacity is now 12,162,000 bushels, and provision has been made to increase this to 24,162,000 as the need develops.

down in clearing his land. Important settlements now growing up in the Laurentian area are located in the Abitibi and Timiskaming districts near the Ontario boundary, and in the vicinity of lake St. John.

A Network of Railways.—The older-settled portions of the province are well supplied with railways. At Confederation, in 1867, Quebec had slightly less than 600 miles of steam railway, whilst to-day the total railway mileage of the province is 4977. The railways are almost all comprised under the two large systems, the Canadian National and the Canadian Pacific. The map of the fertile Eastern Townships, sometimes designated as the garden of the province, shows a veritable network of railways. The St. Lawrence valley is also particularly well served. A principal line of the Canadian National railways from Halifax, entering the province in the Gaspé district, extends the whole length of the St. Lawrence valley to Montreal, passing through Lévis, opposite Quebec. Another principal line of the Canadian National runs eastward from Montreal through the Eastern Townships on its way to Portland, Maine, on the Atlantic coast. Both Canadian National and Canadian Pacific have lines connecting Quebec with Montreal, and the latter with Ottawa. The Laurentian plateau is pierced by the main line of the Canadian National system running from Quebec westward to the Pacific coast, and a branch of the same railway extends from Quebec to the Lake St. John district. The Canadian Pacific sends several branches from the St. Lawrence and Ottawa valleys up into the picturesque Laurentian country; one extends from Montreal to Mont Laurier, one from Ottawa up the Gatineau valley to Maniwaki and another from Ottawa to Waltham.

ROADS

A Good Roads Policy.—Quebec holds a leading place among the provinces of Canada for good roads. This is due to the "Good Roads" policy of the Provincial Government inaugurated in 1907. Since then, by grants and subsidies it has encouraged and promoted the making, improvement and maintenance of municipal roads and highways. From 1912 to the end of 1922 no less than $38,977,876 has been expended for this purpose, resulting in the construction of 4,527 miles of new roads. Not only has it spent largely, but it has spent wisely on colonization roads, and bridges, the latter, wherever possible, of steel and concrete construction. From 1867 to 1921, the sum of $9,178,307 was spent in building colonization roads to assist settlers. It has bought out turnpike roads and toll bridges, 25 of the latter having been abolished since the adoption of this policy. Particular attention has been paid to farm and market roads, and these are now classed among the best improved earth roads in Canada.

Colonization Roads.—In order to open up new roads for incoming settlers and also to improve the existing colonization roads in the newly settled regions of the province, $5,000,000 was voted in 1920. Of this

amount $4,000,000 has been already expended, and $2,000,000 additional was voted in 1922. The $4,000,000 already spent since the appropriation of 1920, was expended in opening entirely new roads in the new colonization centres and in repairing and completing some of these roads and others which had already been opened up. The number of miles opened up or repaired or finished was 3,660, showing an expenditure of approximately a thousand dollars per mile.

Maintenance of Roads.—Until recently, maintenance of Government highways in Quebec has been left largely to the municipalities. The Government simply built a road through a certain district, made a grant of as much as 50 per cent towards its up-keep, and left the rest of the maintenance burden to the municipality through which it passed. In the beginning of the road-building era, when the policy was costing heavily and was largely experimental, this system was perhaps pardonable; but its results were bad. In most, or many, of the districts concerned, farmers

IN THE HEART OF THE FINANCIAL DISTRICT, MONTREAL

A view of St. James Street, where many of the "Big Deals" in Canadian finance are closed.

protested that they could not bear the cost. They claimed, and not unreasonably, that they were being compelled to keep up roads which others wore out; that most of the roads, although supposed to benefit farmers chiefly, were mostly for the advantage of automobile owners, in what may be termed "through passenger traffic," and which was of slight concern to the municipal taxpayer. The result was that municipalities taking this stand, declined to hold up their end, and roads whose initial cost was large were allowed to pass into disrepair.

It is not sufficient to build good roads if they are not maintained when built, and Premier Taschereau at the session of the Legislature which terminated Dec. 30, 1922, asked and obtained authority for the provincial government to assume the whole cost of the up-keep of all highways which it constructs. A special roads department known as the Maintenance and Repair of Roads Bureau, at the head of which is a general superintendent, will carry out, under the direction of the Minister of Roads, the maintenance and repair of macadamized, gravelled, or otherwise improved roads.

By the new bill, entitled "An Act Respecting the Maintenance and Repair of Roads, and to Amend Various Acts Concerning Roads," the roads of the province are classified under four heads:—

(1) Provincial Highways, meaning all roads built by the Government before January 1, 1922. These include the King Edward Highway, the Montreal-Quebec Highway, the Sherbrooke-Derby line, the Levis-Jackman, the Three Rivers-Grand Mère, and the Chambly roads.

(2) Regional Roads, that is, roads which the Minister of Roads considers are highways where the traffic and the circulation of it, makes them communication roads.

(3) Improved Roads, that is, roads that have been gravelled, macadamized, or built in a manner considered permanent by the Minister of Roads, with money supplied wholly or in part by the Government.

(4) Earth Roads, meaning roads which may or may not have been graded; farm or occupation roads.

The province will maintain completely the provincial and regional roads, but the municipalities will be called upon to contribute towards the first cost. At present, the municipalities are compelled to contribute half of this. Under the new bill the Minister of Roads will have discretionary powers in this regard but the municipality's share is never to exceed 50 per cent. This allows the Minister to take into account the ability of the municipality to pay, the character of the traffic, the length of highway to be maintained, and any other aspects of the case that ought to be considered.

In the settled parts of Quebec alone there are about 54,000 miles of roadway system which will fall within one or other of the above four categories, and they may be briefly summarized as follows:*

Surveyed earth roads	35,867	miles
Improved earth roads	12,501	"
Gravelled roads	3,183	"
Waterbound and asphaltic macadam roads	2,457	"
Total	54,008	"

With regard to the improved roads, the Act requires that they shall be kept in good repair by the municipalities, but the latter have the choice of two plans. They may undertake the maintenance themselves, with the provision that, if they fail, the General Superintendent of Maintenance and Repair can notify the municipalities that they must undertake the repairs within a certain time, and if they do not, the work will be done by the Government and charged to the municipality or municipalities concerned. The other plan is, to allow the Minister of Roads to enter into a contract to repair the roads, and also contribute a share of the cost, the municipality paying the remainder. With regard to the surveyed earth roads, the Government will strictly supervise their maintenance and see that all grants are properly spent.

The sum of $7,500,000 was appropriated to be spent on roads in 1922 as follows:

Regional roads	$3,450,000
Municipal work (day and contract)	2,100,000
Rebuilding and up-keep	1,450,000
Special works, and administration	500,000
	$7,500,000

Federal Assistance.—Quebec shares in the road building grants made to the provinces under the Canada Highways Act of 1919 whereby, over a period of five years, the Dominion Government divides the sum of $5,000,000 among the several provinces on the basis of $80,000 to each annually, in addition to a further sum computed in proportion to population. The highways aided under this act comprise main and market roads selected by the provincial government with a view of encouraging agricultural production and stimulating trade.

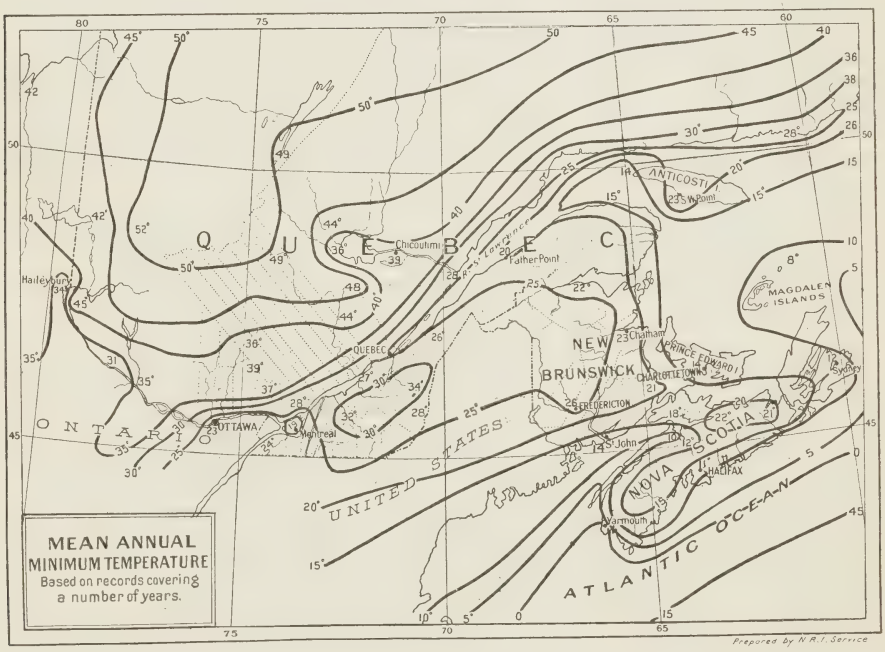
CLIMATE

Extending over such a large area, Quebec presents a considerable variety of climate. In Europe the latitudes corresponding to those of Quebec stretch from Northern Italy nearly to Iceland, but, so far as climate is concerned, that of Quebec is more comparable to the climate existing in the area between the Black Sea and Finland, where summer heat and winter cold are more definitely marked over a wide expanse In Quebec, too, the climate becomes gradually colder towards the north, but it is rather the physical facts of Arctic winds sweeping from Hudson bay and

*City and suburban streets, avenues and park driveways of concrete or asphalt are not included in this summary.

the presence of icebergs off the coast of Labrador and in the Gulf that shorten the season for growing crops in parts of the province. Though this drawback is offset by the longer hours of daylight in the north, where, as in Abitibi, a man may work from 3 a.m. to 9 p.m. in four months of the year, yet the climate of the long-settled regions to the south is at present better suited for farming. It is quite probable, however, that the clearing of the forests will have as good an effect in newly-opened parts as it has already in the prosperous region of lake St. John, where unseasonable frosts have become less frequent with the spread of cultivation.

An Invigourating Climate.—With the exception of the northern territory of Ungava, where the summer is scarcely three months long and the winters are very severe, the climate of Quebec is healthy, and favourable to most forms of agriculture. The prevailing features are long, cold winters; short springs and warm, bright summers. Though cold, the



winters are most exhilarating; for the atmosphere is dry and tonic and there is abundance of sunshine. The climate is a healthy one, and physicians from many parts of America send patients with lung trouble to the sanatoria in the Laurentian country, the most famous of which are located at Ste. Agathe, in the mountains north of Montreal, and at Lake Edward, a hundred miles north of Quebec. The snowfall is heavy, especially in the eastern portions of the province. This, however, is not without its advantages. To say nothing of the joys of winter sports, or the tonic of the bright winter days, the snow is a god-send to the lumberman and a

blessing to the farmer. A heavy snowfall protects the winter wheat and the grass from damage by frost; snow being a non-conductor of heat, the deeper the snow the warmer the ground; the fertilizing elements it contains filter into the ground with the thaw; its presence gives the soil a rest and prevents leaching in the winter; by slow permeation it keeps the soil moist much longer than does its equivalent in rain, and its slow melting on the heights is a check on wasteful floods.

Tourists Are Attracted.—"Autumn is a charming season throughout the province; the air is cool and the sunshine bright and mellow. The changing foliage, especially of the maple and birch, paints the woodland hills in crimson and gold, and gives the whole landscape a matchless beauty. The charms of its summer and the beauties and sporting attractions of its rivers and lakes draw to Quebec each season thousands of visitors from many parts of the continent, who come here to spend those months when the heat in southern cities is almost unbearable."*

The tables which follow show the hours of sunshine, temperature, and precipitation for each month in widely separated localities, both in the long-settled areas and in those in which colonization is now in progress.

AVERAGE HOURS OF SUNSHINE

(*No record north of the St. Lawrence*)

Month	Montreal (10 years)	Sherbrooke (10 years)	Quebec (10 years)	Mistassini (6 years)	St. Anne de la Pocatière (10 years)
Jan.	76·0	73	86	99	91
Feb.	103·4	99	105	121	104
March	145·9	153	152	176	149
April	173·7	190	174	183	173
May	204·6	200	197	214	220
June	217·3	250	248	231	217
July	238·4	264	223	241	247
Aug.	218·6	215	224	230	232
Sept.	171·5	168	152	147	173
Oct.	122·2	125	123	105	105
Nov.	68·5	63	65	65	79
Dec.	60·0	48	70	69	73
Totals	1,800·1	1,848	1,819	1,881	1,863
Annual daily mean	4·93	5·06	4·98	5·15	5·10

Quebec, The Land of Plenty, published by the Government of Quebec.

TEMPERATURE

Month	Montreal (50 years)		Sherbrooke (10 years)		Quebec (20 years)		Mistassini (10 years)		Abitibi (22 years)		Anticosti S.W. point (30 years)	
	Mean daily temp.	Extreme monthly range	Mean daily temp.	Extreme monthly range	Mean daily temp.	Extreme monthly range	Mean daily temp.	Extreme monthly range	Mean daily temp.	Extreme monthly range	Mean daily temp.	Extreme Monthly range
Jan.	12·7	79	13	69	9·7	81	−3	95	0·3	91	11·9	87
Feb.	14·3	71	10	65	12·0	81	Zero	84	0·6	97	12·5	81
March	24·6	76	24	60	22·8	87	14	98	14·6	104	21·0	67
April	41·3	69	39	44	37·0	77	33	97	31·5	90	30·5	74
May	52·9	66	53	59	52·0	67	48	69	46·0	77	39·8	59
June	63·9	54	62	47	61·2	56	57	69	55·8	67	48·4	59
July	69·1	48	68	43	66·1	57	64	57	64·2	60	56·6	45
Aug.	66·1	47	63	45	62·8	52	60	63	60·7	60	56·2	52
Sept.	58·5	57	56	57	55·3	59	52	66	52·0	61	48·7	53
Oct.	46·0	59	45	60	42·0	63	40	65	40·4	65	39·8	60
Nov.	33·3	68	32	39	32·2	76	24	72	24·8	84	30·2	58
Dec.	19·6	80	18	76	15·0	82	7	93	8·2	93	20·5	91
Average...	41·8	.....	40	.....	39·0	.....	33	.....	33·3	.....	34·7	.....

PRECIPITATION
(In inches)

Month	Montreal (50 years)		Sherbrooke (10 years)		Quebec (20 years)		Mistassini (10 years)		Abitibi (22 years)		Anticosti S.W. point (30 years)	
	Rain	Snow	Rain	Snow	Rain	Snow	Rain	Snow	Rain	Snow	Rain	Snow
Jan.	0·85	31·4	0·76	24·4	0·64	30·7	0·16	22·0	0·03	17·3	0·58	18·3
Feb.	0·72	26·1	0·61	23·2	0·74	27·3	0·26	18·3	Trace	14·0	0·25	14·7
March	1·45	19·5	1·37	21·3	1·29	19·9	0·57	10·8	0·15	19·3	0·50	12·0
April	1·69	5·3	1·70	7·7	1·42	6·4	1·67	5·1	0·76	4·6	1·12	5·6
May	3·01	0·1	3·59	1·1	3·01	0·4	2·48	0·6	2·43	2·0	2·40	0·4
June	3·21	.....	3·58	.....	3·83	.....	3·60	.....	2·41	Trace	2·93	0·1
July	3·95	.....	3·66	.....	4·30	.....	3·74	.....	2·62	.....	3·14	.....
Aug.	3·35	.....	3·11	.....	4·00	.....	3·05	.....	2·64	Trace	3·43	.....
Sept.	3·46	.....	3·94	.....	3·77	.....	2·94	.....	2·58	Trace	2·92	.....
Oct.	3·13	1·4	2·59	1·5	2·94	1·5	2·55	2·1	2·67	2·4	3·40	0·5
Nov.	2·26	11·7	1·29	12·9	1·75	14·2	0·91	11·5	0·89	12·5	2·05	6·4
Dec.	1·17	25·2	0·99	24·6	0·85	25·2	0·40	25·0	0·12	18·7	0·65	14·7
Totals	28·25	120·7	27·19	116·7	28·54	125·6	22·33	95·4	17·30	90·8	23·37	72·7

TOUCHES OF THE OLD WORLD IN THE NEW MEET THE TOURIST IN QUEBEC

POPULATION

French Canadians Predominate.—The population of Quebec according to the census of 1921 is 2,361,199. Of this, French Canadians constitute 80 per cent. In many districts the population is almost exclusively French-Canadian. The Eastern Townships were originally settled by United Empire Loyalists and other English-speaking people, and although there are proportionately more English-speaking people in this district to-day than elsewhere, the French-speaking element is gradually gaining ground. Indeed, the French-Canadian population has overflown into the New England States and forms a large portion of the operatives in the textile, shoe and other manufacturing industries there. The new settlement districts of the province are attracting a population that is predominantly French.

The Habitant.—The rural French Canadian, known as the *habitant* has long been famed in song and story, sharing honours with the picturesque *voyageur*. But under modern conditions, they have both undergone such a rapid change that they have now almost vanished. An influence that has contributed much to modernize the younger generation is the accessibility of the cities by automobile, one effect of which is seen in the prevalence of city fashions among the womenfolk of the country. The spinning-wheel has been removed to the attic and the *étoffe du pays* is no longer seen except to be sold to unsophisticated tourists. Still a steady, industrious, thrifty, home-loving individual, strongly attached to his church and fond of political discussion just as much as formerly, the *habitant* has, in the meantime, evolved into a practical farmer. He reads the city and agricultural papers, is a member of a co-operative dairy or cheese factory, wants a rural mail and good roads. Although much of the boisterous enthusiasm of the old-time "Rouges et Bleus" has disappeared, the habitant has remained a keen politician and there is yet a weak spot in his heart for a good orator. Strongly attached to the soil, he generally places his sons on the land round him, but aims at sending some of his daughters to convent and some of his sons to college; for his pride is to have a priest, a lawyer or a doctor in the family. Talks at the church door after service and occasional *soirées* fill up his social programme, but the folk dances and songs are disappearing before phonographs, pianos and modern dances.

Not given to any excess, he is averse to social legislation that would interfere with his personal liberties, and arbitrary prohibitions in any domain have never found favour with him. Temperate, law abiding, traditionally prudent in social matters and having never tasted the hard life of European workers, he is not a ready listener to labour agitator or socialistic propagandist. Strong, willing and resourceful, he makes a valuable employee in mills and factories of all kinds. He is sought after for his unequalled ability as a woodsman; and in fact, from the earliest days of the province he has figured largely in the lumbering and river driving operations for which Quebec has been noted and in which field she is still prominent.

THERE IS MUCH TO INTEREST THE SIGHTSEER IN QUEBEC

GOVERNMENT

Responsible Government.—Quebec enjoys the British system of responsible government. The British North America Act reserves for the exclusive authority of the provinces, matters of purely local and provincial concern, chief among which may be mentioned the imposition of direct taxes, administration of justice, maintenance of jails, hospitals, asylums and similar institutions, the control of natural resources vested in the province, education, property and civil rights and municipal institutions.

In Quebec as in the other provinces the Lieutenant-Governor, appointed by the Dominion Government, is the representative of the Crown. In addition to him the legislature consists of the Legislative Council of 24 members appointed for life by the Lieutenant-Governor in Council, and the Legislative Assembly of 81 members elected by popular vote. The Executive or Cabinet Council in Quebec is composed of the Premier, Provincial Secretary, Provincial Treasurer, Minister of Public Works and Labour, Minister of Agriculture, Minister of Colonization, Mines and Fisheries, Minister of Lands and Forests, Minister of Roads, Minister of Municipal Affairs and one or more ministers without portfolio. French civil law is the basis of civil law in the province.

Local Self-Government.—Municipal government in the province is administered under the Municipal Code which became effective in 1916. In 1918 a special government department, called the Department of Municipal Affairs, was created, mainly to supervise and direct the finances of the municipalities, thus insuring a sound basis and good market for debentures issued. Every municipal corporation borrowing money is required by law to impose taxes each year sufficient to pay the annual interest and provide a sinking fund large enough to retire its debentures at maturity.

Rural and village municipalities are erected under the Municipal Code and their affairs are administered by an elective council of 7 members presided over by a mayor. The county councils are made up of the mayors of the local municipalities within the county. Most urban municipalities have been created under special charter of the legislature, although provision is made for the erection of such municipalities under the Cities and Towns Act.

In 1920 the various classes of municipalities in the province were: city municipalities, 20; town municipalities, 87; village municipalities, 249; parish municipalities, 926. The value of municipally-owned public utilities in 1920 was as follows:

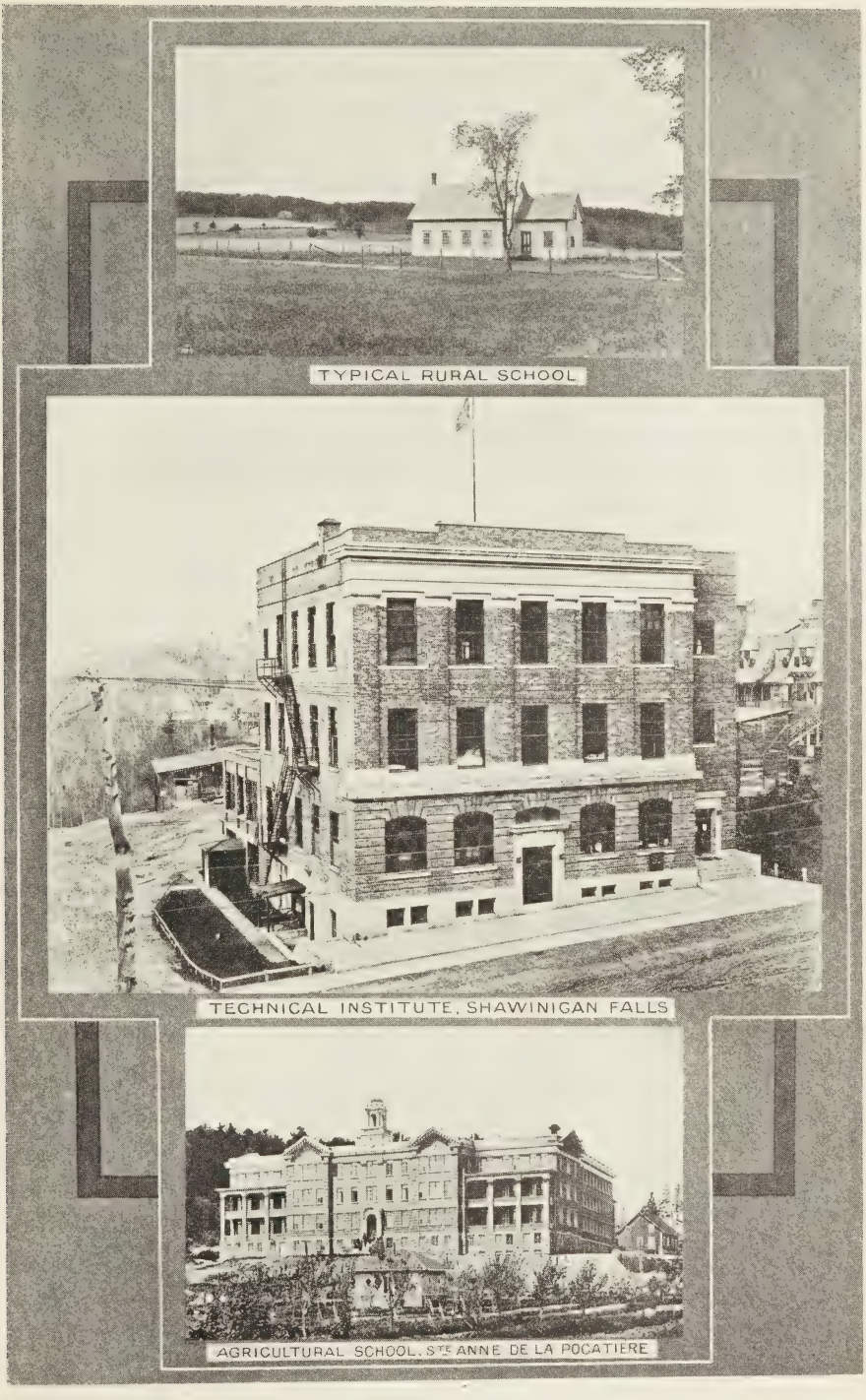
Waterworks and sewers	$ 54,180,400
Gas	366,206
Light	5,725,221
Telephone	3,980
Others	4,265,989
Total	$ 64,541,796

EDUCATIONAL SYSTEM

Provincial Control.—In Canada education is one of the activities of government over which the British North America Act gives the provinces exclusive control, and most of the provincial governments therefore have a department of education in charge of a minister. In Quebec, however, there is no minister of education, but the provincial secretary represents the interests of education in the provincial cabinet and in the legislature. The educational system is in charge of the Department of Public Instruction, the administrative officer of which is known as superintendent of education and is appointed for life.

Council of Public Instruction.—The Council of Public Instruction is the real directing and administrative force in the educational system of the province. It is divided into two committees, the Roman Catholic Committee, having charge of Roman Catholic schools, and the Protestant Committee, which controls Protestant schools. Each committee makes its own regulations for the organization, administration and discipline of its respective schools. The Roman Catholic Committee consists of a number of high dignitaries of the Roman Catholic church, who are members *ex-officio*, together with a number of Roman Catholic laymen appointed by the Governor in Council. The Protestant Committee is made up of Protestant members, both from church and laity, equal in number to the lay members on the Roman Catholic Committee, appointed by the Lieutenant-Governor in Council. The Superintendent of Public Instruction is assisted by an English secretary and a French secretary, each having the rank of deputy minister. These secretaries also act as secretaries of the Roman Catholic and the Protestant Committees of the Council, respectively.

Public School System.—Religion is thus a dominating influence in the organization of the educational system of Quebec, the most outstanding feature being that the public schools are religious in their control and distinctively either Roman Catholic or Protestant. For purposes of primary education the province is divided into school municipalities, the boundaries of which are usually coincident with those of the religious parishes. In 1921 there were 1,718 school municipalities in the province of which 367 were Roman Catholic and 351 Protestant. In a municipality where there are ratepayers of various religious beliefs the minority, as "dissentients," may organize themselves into a separate municipality for public school purposes, electing an administrative board of three trustees. The Catholic schools are administered by an elective board of five commissioners. These trustees or commissioners, as the case may be, levy taxes for school purposes on the supporters of the schools they represent. It is usual to find a board of commissioners and a board of trustees in the same municipality, but in cities like Montreal and Quebec and some others



TYPICAL EDUCATIONAL BUILDINGS IN QUEBEC

with special charters, as well as where boards represent Catholics only or Protestants only, there may be two boards of commissioners. This dual system of schools divided according to religion has been in effect since 1846, and apparently functions without friction.

Higher Education.—There are three classes of schools: primary, secondary and university. The primary course is intended to cover the first eight years of school life and the primary schools are subdivided into elementary, intermediate and superior. Secondary education is given in the classical colleges and the high schools. There are four universities, McGill and Montreal in the city of Montreal, Laval in Quebec, and Bishop's College in Lennoxville. Fourteen normal schools are provided for training teachers. In addition, there are twelve schools of arts and manufactures, three agricultural schools, over fifty household science schools, a dairy school, five technical schools and a school of higher commercial studies.

Bi-lingual Teaching.—It will be seen that Quebec possesses a rather unique educational organization adapted to the needs of a population divided into two parts by religious and racial considerations. Teaching in the public schools is bi-lingual and every holder of a teacher's diploma must pass an examination in the language which is not the candidate's mother tongue. Roman Catholics and Protestants are enabled to have their children taught in a school where not only is the parents' creed respected but where its tenets are regularly taught. No Roman Catholic is obliged to send his children to a Protestant or a merely neutral school nor to contribute towards its support, and *vice versa* for Protestants. Every group of ratepayers belonging to the same religion organizes its own schools, engages its teachers and taxes itself for their support, while the subsidies voted by the legislature are apportioned by the Superintendent of Public Instruction among the Roman Catholic and Protestant schools proportionately to the number of pupils enrolled in the previous year.

CHAPTER III

The Leading Industry—Agriculture

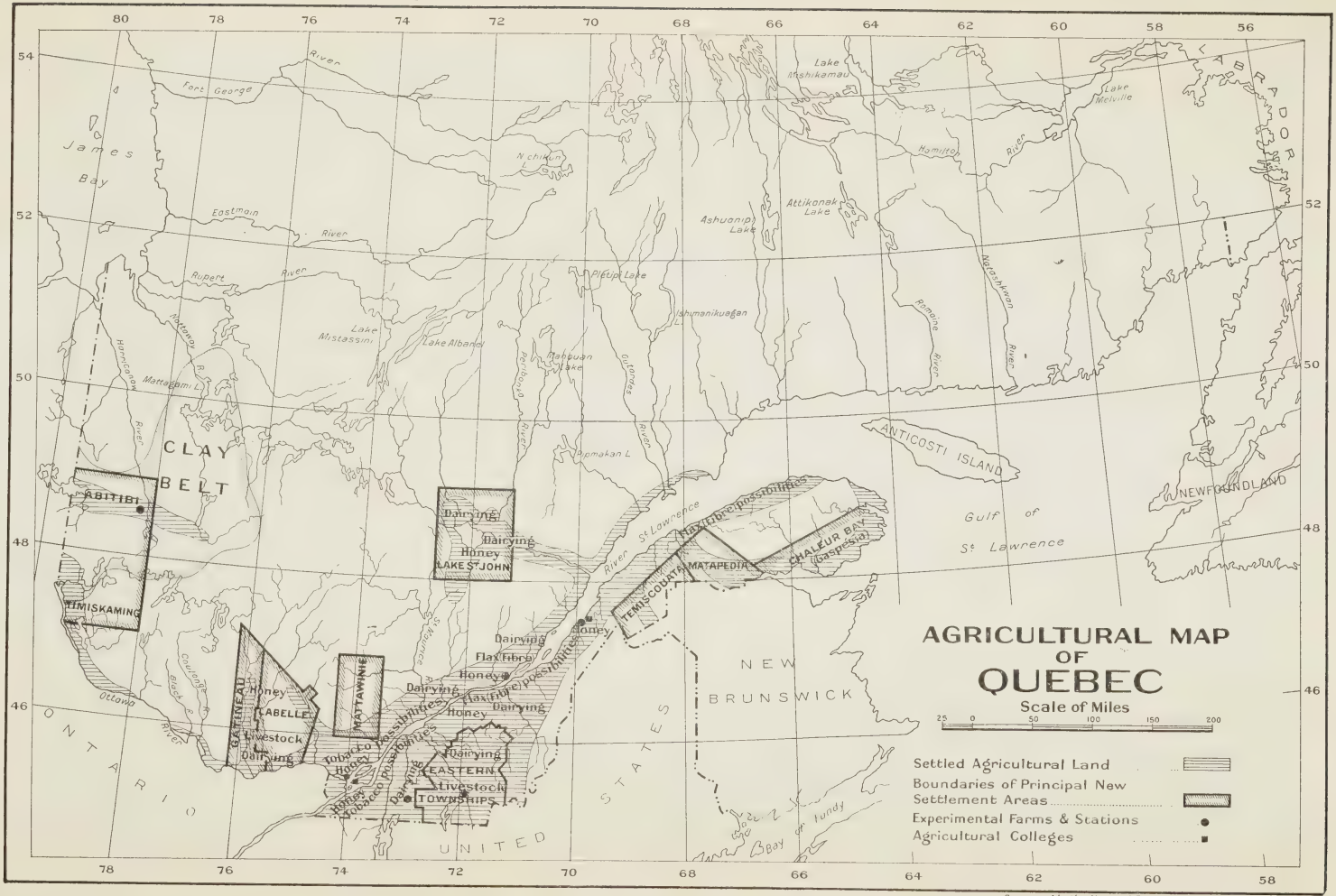
FIRST among the primary industries of the province is agriculture. The chief agricultural areas are found in the western portion of the province, mainly in the valleys of the St. Lawrence and the Ottawa rivers and in the Eastern Townships. Promising new agricultural areas are, however, being opened up along the line of the National Transcontinental railway (now part of the Canadian National system), in the Timiskaming and Gaspé and Lake St. John districts, and elsewhere. According to the latest available returns, approximately 25,000,000 acres are occupied in the province, of which about half is cultivated. The farm acreage in 1921 was 17,257,012 and the value of all farm property $1,096,786,970, an increase of nearly 40 per cent over 1911.

In common with the rest of Canada, the rural population of Quebec as compared with the urban is declining. The accompanying table indicates the extent to which this has taken place since 1901. Various causes have been given for it, not the least important of which is the improvement of agricultural machinery and methods of production, thus enabling as great, if not greater, production with fewer hands.

RURAL AND URBAN POPULATION IN QUEBEC, 1901–1921

Year	Total Population	Rural Population		Urban Population	
		Number	Per cent of total	Number	Per cent of total
1901	1,648,898	994,833	60·34	654,065	39·66
1911	2,005,776	1,038,934	51·80	966,842	48·20
1921	2,361,199	1,038,630	43·99	1,322,569	56·01

Systems of Farming.—Generally speaking, three systems of farming are practised. In the counties along the St. Lawrence from Montreal to Quebec and from Montreal to the Ontario boundary, the main revenue of most farmers is derived from hay and grain, although dairying is gradually superseding these. In the greater part of the Eastern townships, together with the counties bordering the state of Maine, in the St. Lawrence valley from Quebec down to and including the Lake St. John district, and in the Labelle, Gatineau and Mattawinie districts, dairying is the main source of revenue. Sheep and swine are generally kept as side lines. Beef production, though it has been declining for many years, is still practised with a certain degree of success in the Ottawa and Gatineau valleys and in a



Prepared by the Natural Resources Intelligence Service

few sections of the Eastern Townships. It is principally on the farms of the Eastern Townships, too, where the most numerous flocks of sheep are to be found.

Quebec holds a leading place among the provinces of Canada in the value of its agricultural production. The diagrams on pages 29 and 40 show graphically the value of agricultural production in the province in the two main divisions, field crops and farm animals, for each of the years 1914 to 1922. The decline in value in the later years is due, not so much to a decrease in production, as to the pronounced slump in the prices of agricultural products as an aftermath of the war.

Field crops surpass all other branches of agriculture in value. Of these, oats stand supreme with a production in 1922 valued at $38,614,000. The value of potatoes grown was $18,342,000, but slightly less than that of oats. The most valuable of all the field crops, however, are the fodder crops, and of these hay and clover stand first. Of the total value of field crops produced in 1922 of $165,160,000, hay and clover with $75,558,000 constituted 46 per cent. Fodder corn and alfalfa were valued at $6,202,000 and root crops at $6,638,000.

The adaptability of the soil and climate to the production of fodder crops is not unrelated to the prominent position the dairy industry has attained. Since the development of grain-growing on a large scale in the Prairie Provinces, Eastern Canadian agriculture has had to concentrate its attention more and more on the dairy industry and this has proved very profitable. Quebec, especially the Eastern Townships, is noted for its splendid herds of Ayrshire cows, and for its dairy school at St. Hyacinthe In 1922, there were 1,768 cheese and butter factories in the province, most of them run co-operatively by the farmers, producing butter and cheese to the value of $24,417,885. It is estimated that the value of the milk and cream sent to the two cities of Quebec and Montreal alone amounted in that year to over $14,000,000.

Other branches of live-stock raising flourish in Quebec. The province is famous for its beef cattle, and as a by-product of the dairy industry, large numbers of hogs are profitably raised. Poultry raising is in a prosperous condition. Chanteclere breed, produced to withstand the severe climate of Quebec, was originated by the monks at Oka.

The province produces large quantities of apples of the hardier varieties, of which the Fameuse is perhaps the best known. Small fruits do well, although the cold of the winters prevents the growing of many varieties that flourish in southern Ontario. Strawberries are grown in large quantities and the famous musk melons of the island of Montreal are in demand at high prices in the United States.

Tobacco has been grown for scores of years and a tobacco manufacturing industry of considerable proportions has developed. In the manufacture of maple sugar Quebec stands first among the provinces

Beekeeping is growing in importance, favourable conditions for this industry being available throughout the province, especially in the southern Laurentian plateau.

In the following sections, the main branches of the agricultural industry will be treated in some detail.

GOVERNMENT ASSISTANCE TO AGRICULTURE

Agricultural Societies.—Government assistance to agriculture has been especially generous. Grants have increased from $609,962 in 1913-14 to $1,718,204 in 1921-22. Of the latter sum, $1,447,091 was given by the Provincial Government and $271,113 by the Dominion. This is partially disbursed through various farmers' societies. In 1921 there were 89 agricultural societies and 727 farmers' clubs having an aggregate membership of 64,279. There are in addition numerous other agricultural associations of a co-operative character. Assistance is often given to an agricultural community by the Government affording financial help in the purchase of improved stock for co-operative use, in supplying improved strains of seed and in assisting in the purchase of agricultural machinery, such as clover hullers, for community use. A well-organized corps of lecturers and demonstrators in agricultural subjects is provided by the Provincial Department of Agriculture, and systems of Government inspection of products to improve marketing conditions are established, as in the cheese and butter industry. The Provincial Department of Agriculture also supplies seeds and chemical fertilizers for the school gardens, of which there are in the neighborhood of 1,200 in the province.

Demonstration Farms.—Recently legislation was passed authorizing the Minister of Agriculture to establish demonstration farms and to remunerate the owners of such farms for experiments carried out under Government supervision. The supervision of these farms is under the chief of the Field Husbandry Service, who prescribes what methods of farming shall be followed, how the soil is to be worked, what drainage work is to be done, how the live stock are to be fed, and anything which tends to add to the value of the farm, and make it an object lesson to other farmers.

District Representatives.—An important feature of the assistance that is given the industry by Government is the system of resident agronomists, elsewhere known as district representatives or county agents. Some fifty-seven counties are now supplied with these missionaries of scientific farming. They are graduates of recognized agricultural colleges and reside in the counties where they are constantly endeavouring by lectures, visits and demonstrations to secure the adoption of efficient farming methods.

Schools for Farmers.—There are three advanced agricultural schools as well as a dairy school in the province. The former consist of the Oka Institute, in the county of Two Mountains, the property of the Rev.

Trappist Fathers; the Ste. Anne de la Pocatière Agricultural School, in the county of Kamouraska, owned by the priests of the classical college of the same place; Macdonald Agricultural College at Ste. Anne de Bellevue, the property of a society. The first is affiliated to Montreal University and the second to Laval University, while Macdonald College is affiliated to McGill University. Students have been flocking to these schools for some years past. In 1910 there were 134 students, while, in 1922, no less than 987 followed the courses of these three institutions.

HARVESTING OATS IN QUEBEC
This crop yielded 80 bushels to the acre.

The Provincial Dairy School is situated at St. Hyacinthe, in the Eastern Townships. It was originated by the local dairymen's association in 1892 with Government assistance, and its purpose is to train cheese and butter makers and inspectors. The present school was built by the Government of the province in 1905 at a cost of $100,000. No butter or cheese factory can be operated in the province unless it is under the supervision of an operator holding a diploma or certificate from this dairy school. In 1922 the number of students registered was 359, and of this number 328 were awarded certificates.

FIELD CROPS

Value of Field Crops.—In 1918 for the first time in the last twenty years, the value of field crops surpassed that of live stock by about twenty million dollars, the increase in the former over the preceding year being 81 per cent and that of live stock 26 per cent. (See diagrams on pages 29 and 40). Likewise, in 1919, 1920, 1921 and 1922 the field crops were of greater value than live stock.

The value of field crops in eight years from 1915 to 1922 inclusive has been as follows:

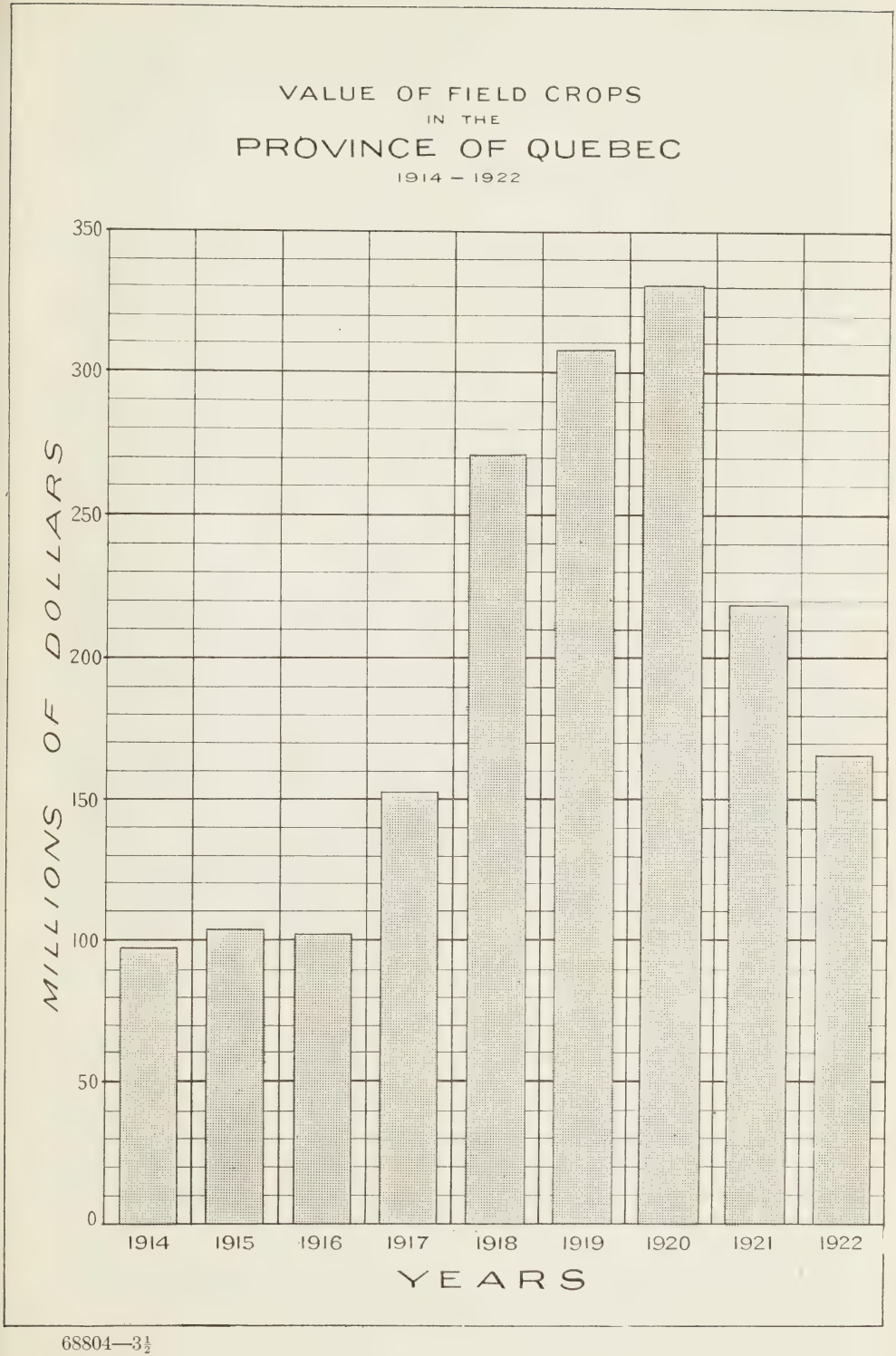
1915	$ 104,683,000
1916	102,937,000
1917	153,197,900
1918	276,776,900
1919	309,963,000
1920	330,251,000
1921	219,154,000
1922	165,159,600

Area in Field Crops.—Out of an area of 24,571,330 acres of unoccupied land, 7,435,300 were seeded to field crops in 1922. The comparative table below gives the acreage sown to the various crops in the years 1911, 1917, 1920, 1921 and 1922:

FIELD CROP ACREAGE IN QUEBEC, 1911-1922

Crop	1911	1917	1920	1921	1922
	Acres	Acres	Acres	Acres	Acres
Spring wheat	71,101	277,400	222,045	180,616	145,047
Oats	1,439,964	1,492,700	2,205,908	2,366,810	2,252,016
Barley	100,701	165,600	194,444	191,673	155,578
Rye	12,833	22,450	28,462	24,940	18,736
Peas	32,595	66,457	60,870	65,259	64,096
Beans	6,085	55,157	35,835	28,272	29,812
Buckwheat	114,780	163,577	151,765	150,666	167,185
Mixed grain	114,572	122,819	143,423	168,245	139,697
Flax	1,428	5,700	16,035	8,641	5,880
Corn for husking	23,900	74,339	47,741	46,182	53,379
Potatoes	125,995	226,917	310,692	222,084	206,234
Turnips and other roots	14,393	70,192	83,613	53,084	48,812
Hay and clover	3,356,692	2,961,983	4,290,121	4,426,671	3,998,036
Fodder corn	38,375	69,030	86,833	89,546	120,592
Alfalfa	2,980	3,818	28,200	29,300	30,200
	5,455,294	5,778,139	7,905,987	8,051,989	7,435,300

Wheat Growing.—Before the development of the western provinces the Quebec farmers raised more wheat than the province required, so that there was a considerable quantity for export. The ease with which prairie land could be worked and its adaptability for wheat growing rendered the culture of that cereal less profitable in Quebec and accordingly fodder and other grains, principally oats, were grown instead. The high price of wheat in 1918 induced more Quebec farmers to sow this cereal and as a result a record crop was harvested, the value being over fourteen million dollars. The reports of the Dominion Bureau of Statistics show the following average yields in bushels per acre of spring wheat for the ten years 1913-1922: Quebec, 16·25; Manitoba, 16·50; Saskatchewan, 14·50; Alberta, 15·25; Canada, 15·59. It is thus seen that the soil of Quebec is as well suited for wheat growing as any in the western provinces, once the land is cleared and made ready for cropping.


VALUE OF FIELD CROPS
IN THE
PROVINCE OF QUEBEC
1914 – 1922
MILLIONS OF DOLLARS
350
300
250
200
150
100
50
0
1914
1915
1916
1917
1918
1919
1920
1921
1922
YEARS

68804—3½

Fodder Crops Increase.—Large crops of other grain are grown as shown by the preceding table. Considerable acreage is given over to the raising of fodder for live stock which forms a very valuable asset of the province. In fact one of the outstanding facts in the above compilation is the increase in the acreage devoted to fodder crops, that of alfalfa increasing from 3,818 acres in 1917 to 30,200 in 1922.

Flax.—Although flax has been grown for its fibre, in Quebec, since Hébert established the first Canadian farm in 1617, it is not one of the principal crops. It is readily grown in the province, however, and the curtailment of the supply of linen from Europe should provide a good opportunity for flax growers here.

Although the climatic and soil conditions for the production of flax fibre in Quebec are perhaps superior to those of Ontario, Quebec has not taken advantage, as the latter province has, of the great impetus given the flax industry through the practical discontinuance of the production of flax in Russia, which formerly supplied about three-quarters of the world's supply and for the eight years prior to 1914 exported to Great Britain 50 per cent of the latter's imports of this commodity.

For the production of good fibre a very moist climate with a long moderately-growing season is required. In Canada these conditions exist in the western part of British Columbia, southwestern Ontario, the valley of the St. Lawrence and the Maritime Provinces. From experiments made by the Department of Agriculture at Ottawa, Canadian flax is equal in strength to the better grades of Irish flax and is capable of yielding yarns of excellent quality. In the Gaspé peninsula, Quebec, a fibre is produced superior to any grown elsewhere in Canada.

Always a troublesome crop to grow, flax brought in only from ten to twelve cents a pound for the fibre before the war. There were no labour-saving devices and in retting and scutching the primitive methods used in the days of the Pharaohs prevailed. As a result, the industry gradually declined for years as it did in Ireland, Belgium and Holland. The war, however, radically changed these conditions, and with the improved mechanical appliances for manufacturing that have been perfected in the past few years, a brighter outlook for the industry is indicated.

With the excellent opportunities that the valley of the St. Lawrence presents for the cultivation of large areas of flax for fibre, it should be possible for the province of Quebec to build up an export trade in this raw material and at the same time furnish supplies for home manufacture. Up to the present, the market for Canadian fibre has been almost exclusively in the United States from whence we have imported large quantities of flax products that could very well have been produced in Canada.*

*For further information on this subject and full details as to the method of cultivation of flax and fibre, apply to the Dominion Experimental Farm, Department of Agriculture, Ottawa.

Tobacco.—Favourable climatic conditions and suitable soil for the cultivation of semi-tropical plants, like tobacco, are to be found north of the St. Lawrence river from Berthier to Two Mountains, and south from Yamaska county west to the United States border, except, of course, where the nights are too cool to enable the early maturing of the crop.

The growing of tobacco in the province is no longer a local industry. A large proportion of the Quebec crop is still used in the raw leaf but an increasing portion is taken over by the large manufacturers and used as pipe tobacco, cut, or pressed into plugs.

The area planted to tobacco in the province in 1922 was estimated at 16,573 acres, and the average yield per acre at 900 pounds. This represents a total yield of 14,915,700 pounds, valued at $1,789,884 or 12 cents per pound. The industry is protected by a duty of 40 cents per pound on the imported leaf.

A GOOD CROP OF TOBACCO
Favourable conditions for growing tobacco are found on both sides of the St. Lawrence and an important industry has been built up.

Varieties Grown.—Selection of the most suitable varieties must of course be governed by the climatic and soil conditions of the locality. The season is very short, extending from June 8 to the end of August, and experiments should be made only with the small varieties such as the Canella and those of the Havana type of small tobacco (Small Havana and Petit Rouge). In spite of the smallness of the leaf, a reasonable yield per acre is readily obtainable by setting the plants more closely. These small tobaccos mature early and are comparatively easy to cure. Where the growing season is a little longer, it is possible to grow successfully larger varieties of the seed leaf type, like the Havana Seed Leaf, Comstock

Spanish and Connecticut Havana, as well as a pipe tobacco of rather small size, the Belgium Obourg. These tobaccos can be transplanted by the beginning of June and harvested before the end of August and sometimes, when the season is late, in the first week of September. The curing is comparatively easy. If the season extends from the beginning of June to the middle of September without serious danger of frost and especially if the soil is sufficiently light to allow of rapid maturity, larger varieties like the Connecticut, Blue Pryor and General Grant can be grown successfully.

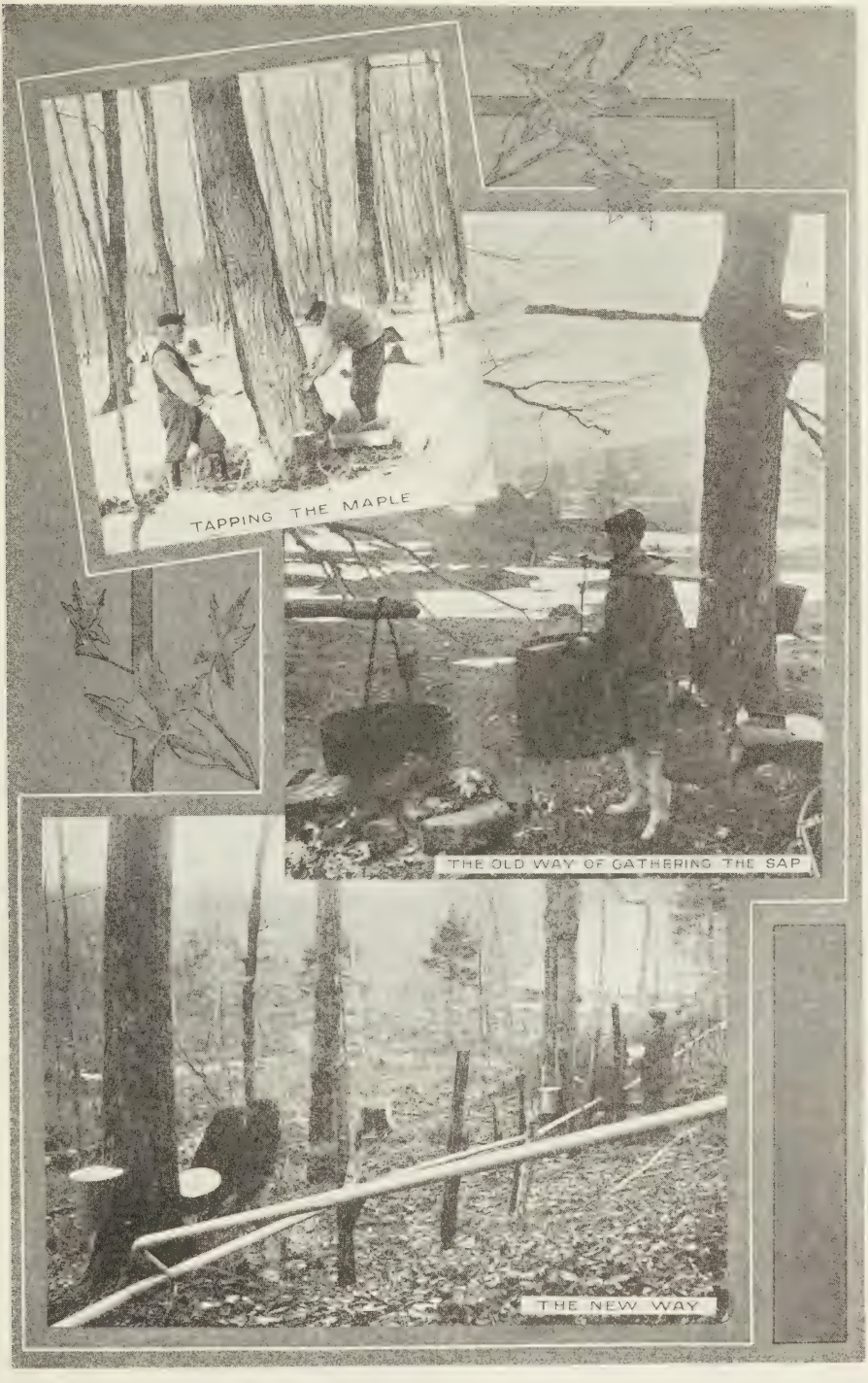
Certain varieties like the Comstock Spanish are in great demand as cigar binders. Some manufacturers claim that the Canadian binders from the Yamaska valley and from the counties of Montcalm and l'Assomption are not inferior to the binders of Wisconsin. In the fall of 1917, when prices were high, binder tobacco brought from 30 to 35 cents a pound. Canadian manufacturers who, until recently never used this Canadian product, are now purchasing a large part of the Ontario and Quebec crops.

There are good possibilities for producing in the province filler tobaccos which would compare most favourably with some of the Ohio and Pennsylvania fillers. This portion of the industry, which is now in its initial stages, is expected to make rapid progress.

MAPLE SUGAR MAKING

The production of maple sugar in Quebec constitutes an industry of considerable importance and in some localities proves a highly important source of revenue. It is made at a time of the year when the farmers are not otherwise busy and the maple bush frequently occupies rocky ground that could not be otherwise developed profitably. The extensive manufacture in recent years of substitutes for the genuine maple product has tended to lower the price of the latter, and this, along with the high price of maple wood for fuel and lumber, has, in many cases, induced the farmer to cut down his sugar bush. As the maple is a slow-growing tree, it is unlikely that these sugar bush areas will ever be replaced.

Eastern Townships Centre of the Industry.—The central area of the sugar industry in Quebec is the Eastern Townships. Sugar maples also grow in Ontario, New Brunswick and Nova Scotia, but of half of the world's supply of maple products furnished by Canada, Quebec supplies about 95 per cent. In 1922 the province produced 9,016,650 pounds of sugar and 1,575,074 gallons of syrup. The average number of trees per farm in the province is about 750, although many farmers tap over 1,500. In 1921 the yield was 12,285,514 pounds of sugar and 1,375,635 gallons of syrup, as compared with 15,615,141 pounds and 1,449,649 gallons in 1920. The value of the production in 1922 was $4,188,000. In 1921 it was $4,318,970, and in 1920, $6,747,151. The maple product of Quebec is marketed mostly in the United States where it is consumed as such or used in the manufacture of candy.



THE MAPLE SUGAR INDUSTRY

Canada produces half the world's supply of maple products, and of this Quebec furnishes 95 per cent. The centre of the industry is in the Eastern Townships.

For the purpose of assisting the farmers to supply the market with a first-class product, the Provincial Government gives an annual grant to a sugar-making school. Nine travelling government inspectors also give instruction in the sugar-making districts when the "run" is on.

Assistance Through Co-operation.—An association called The Co-operative Society of Pure Maple Sugar Makers has also been formed, the members of which devote themselves to this industry. The purpose of the association is to make known the best methods for obtaining products of the highest quality and to protect the consumer by means of a special trade mark which these products bear. The association was instrumental in having a Federal Act passed imposing fines on persons adulterating maple syrup and sugar and selling it as maple products.

FRUIT GROWING

Apples and Pears.—Apples and pears were introduced into New France by the early settlers and records show that the apple was grown as far back as 1663. Apples of the finest appearance and best quality can be produced in Quebec and there are many thousands of acres in the Ottawa and St. Lawrence valleys, in the Eastern Townships, and other parts of the province where they can be successfully grown. Statistics show, however, that the marketed crop, amounting to less than 100,000 barrels annually* is far below what might be expected when the perfection of the Fameuse apple, the Macintosh Red and others are considered. The Fameuse is a beautiful and valuable apple of Canadian origin.

Though the apple and pear industry has been far too greatly neglected there are fine orchards in the province, notably those of the Monastery at La Trappe, at Ste. Anne de Bellevue, in the neighbourhood of Chateauguay, at St. Hilaire, Rougemont and Abbotsford. The total acreage in orchards in 1922 was 45,804. Roughly speaking, climatic conditions are most favourable south of latitude 46 degrees to the United States border, but the hardier kinds can be grown to advantage farther north. For the former region, the following list of apples has been prepared:

Summer.—Yellow Transparent, Crimson Beauty, Duchess of Oldenburg, Langford Beauty.

Autumn.—Wealthy, Alexander, Dudley, McMahan.

Early Winter.—Fameuse, McIntosh, Wolf River.

Winter.—Milwaukee, Bethel, Scott Winter.

For Districts North of Latitude 46 degrees.—Blushed Calville, Lowland Raspberry, Duchess of Oldenburg and Charmaloff, and the later apples,—Golden White, Antonovka, Wealthy, Hibernal, McMahan, Longfield and Patten Greening.

*Quebec produced 88,000 bbls. of apples valued at $569,688 in 1920 and in 1921, a year of poor yield, 35,200 bbls. valued at $251,328. The 1922 crop amounted to 112,500 bbls. valued at $787,500.

Montreal Musk Melons Famous.—The musk-melon growers near Montreal have given more attention to the production of high-class early melons than anywhere else in Canada and have obtained excellent results. The Montreal melon, Montreal Improved Nutmeg, or Montreal Market are standard types. The centre of this industry is the island of Montreal, where the suitable soil and the skill of the growers combine to make a fruit in great demand, not only for the use of the city, but for export across the border.

Plums Are Grown.—Most of the fine varieties of the European plum can be successfully grown in the warmer districts of the province, but only to the best advantage within reach of the climatic influence of the river. For the colder parts of the province, species originating from the wild plum of Eastern Canada (*prunus nigra*) should prove of the greatest value.

"SHOCKING UP" WHEAT ON A QUEBEC FARM

Strawberries Extensively Grown.—In 1922 there were 7,130 acres devoted to the cultivation of berries in the province. In the more southern parts of the province, the regular strawberry picking season begins soon after the middle of June and lasts till the same time in July. For the area occupied and the capital invested, strawberries offer good returns. A good covering of snow usually ensures a good crop of fruit where the winters are cold. As the flowers are very sensitive to cold and the injury from frost in the spring is often considerable, the varieties having the hardiest flower buds have been studied. Of the 750 or more varieties tested at experimental farms in thirty years the following are recommended

as suitable to Quebec: *Commercial Varieties*—Senator Dunlap, Parson, Splendid, Beder Wood, Sample Pocomoke, Warfield. *Domestic Varieties*—Senator Dunlap, Bubach, Belt. The average crop runs to between 4,000 and 5,000 pound boxes per acre, and the normal market price of 10 cents a box reached 20 cents in 1918.

Other Small Fruits.—Raspberries, currants and gooseberries grow well in Canada up to the Arctic circle, so that the cultivated varieties can always be grown for the use of the settler. Years of experiment have enabled the Department of Agriculture to recommend a list of varieties suitable for the different districts of Cap Rouge, Ste. Anne de la Pocatiére, Lennoxville and La Ferme. These lists can be had on application to the Dominion Experimental Farm, Ottawa, or to the Chief of the Horticultural Service in Quebec.

Blackberries as now cultivated are a fruit on a level with the raspberry, and owing to the heavy covering of snow in Quebec survive even in the hardest winters. The plants in winter should, as is the practice with the raspberry, have the tips bent and covered with earth so that the snow may cover the low-lying canes. The varieties recommended for garden culture are Agawam, Snyder and Eldorado.

A FARM HOME IN QUEBEC
The country has its charms, and a home like this is one of them.

The cranberry is a fruit which, except in a few bogs in Nova Scotia and elsewhere, has not been grown commercially in Canada, but, as 20,000 barrels are imported, to the value of $200,000 a year, its culture might be given attention. All three species of this berry grow in Quebec in the wild state.

Cherries are a fruit that might be grown far more generally in the province for the market. A large city like Montreal should not be dependent for its cherries on imports. The district best known at present for this fruit is Chateauguay, but in any section where the climate is tempered by local conditions, the fruit can be grown to profit.

Blueberries Thrive.—In spite of the large quantity of wild blueberries in Canada that find a ready market in the late summer, there is, as some growers have found, market room for blueberries of the size and quality obtainable by careful cultivation. The plant requires an acid soil and therefore can be cultivated on land otherwise of little value. The special type of acid soil is that which consists of a mixture of sand and peat. The soil should be capable of drainage and of surface aeration. The swamp blueberry, which is the desirable species, prefers land which, though submerged in winter and spring, rises above the water level in summer. Valley bottoms liable to late spring freezes should be avoided. It is noticeable that the successful nutrition of the blueberry plant depends in the main on the root fungus which has the power of atmospheric nitrogen fixation.

Plantations may be made either by the careful tending of a wild blueberry patch, or by transplantation of the better bushes, or by seed, or by the special process known as "stumping." In any case commercial crops would not be available for three or four years, but when once in bearing the swamp blueberry may live and produce for a century.

Quebec province has a prosperous trade in blueberries. Great quantities grow in most parts, but the chief districts from which they are marketed are Lake St. John, Charlevoix, Saguenay and Chicoutimi counties on the north side of the St. Lawrence, and Temiscouata on the south. The Lake St. John country is famous for its blueberries and large quantities are shipped every summer, especially from Roberval.

BEE-KEEPING*

In quantity of honey produced, the province of Quebec stands next to the province of Ontario. In 1921-22 there were 7,820 apiaries with 86,991 colonies of bees in the province, with a production of 3,229,216 pounds of extracted and 288,725 pounds of comb honey. The best record for honey production in 1919-20 was from an apiary of 22 hives at Roberval, which yielded an average of over 182 pounds per hive.

Chief Producing Regions.—The principal honey-producing regions are the St. Lawrence valley from lake St. Francis and the lake of Two Mountains to the city of Quebec, the south shore of the same river almost as far as Rivière du Loup, and the Eastern Townships. Apiaries, however, showing as high a yield per colony as in the best districts, are scattered along the north shore of the Ottawa river, in the Labelle region, in the Gatineau valley, in Pontiac county, and in the farming country around lake St. John, and undoubtedly there is a wide and most profitable field

*By the late F. W. Sladen, Dominion Apiarist.

for the extension of bee-keeping in these regions as well as in the principal honey-producing regions, which are by no means fully stocked with bees, except in a few places, as for instance, around the town of Louiseville.

Plant Sources of Honey.—The principal source of the honey is clover—white clover (*Trifolium repens*) and alsike (*Trifolium hybridum*). These plants thrive best in the good farming country. The quality of clover honey is unsurpassed. In many places in the St. Lawrence valley below Quebec, and in the Lake St. John district, there is practically no other source of honey, and the product from these regions is therefore of the highest quality. The absence of other principal sources of honey in the above-mentioned localities simplifies the two great problems in bee-keeping, the control of swarming—the honey flow being limited to only three to four weeks—and the loss of bees in winter, there being no better food for bees in winter than pure clover honey stored as gathered. In the farming country around lake St. John, the bees winter well, although they are confined to their hives in cellars for over six months. High yields of honey have been obtained in the few apiaries already established in this region, and there is a particularly promising field there for the extension of bee-keeping.

Buckwheat, basswood, and sweet clover are additional sources of honey in parts of the country between Three Rivers and the Vermont and New York boundary, and in the Lower Ottawa valley.

In the mountains, firewood (*Epilobium angustifolium*) is a source of abundant white honey of fine quality in places recently devastated by fire. This plant flowers perennially in the rich moist lands of the north, for instance the Abitibi region, but how far it will be of commercial value here has yet to be proved. Other sources of surplus honey in uncultivated lands are wild raspberry and various species of golden rod and aster.

Simple methods of modern bee-keeping with hives having movable combs are very generally practised throughout the province, but the old-fashioned box hives are still used in many places, and, with the neglectful methods that accompany their use, are checking the development of the industry. The Italian bee is displacing the black bee above Quebec, and is the better bee for the southern part of the province, but north and east of Quebec, the black or hybrid bee is preferred, because it gathers honey at lower temperatures than the Italian.

Bee-keeping provides a valuable source of income to the farmer who has too small a farm to occupy his whole time. Many such farmers and men engaged in other callings are making the greater part of their income from bee-keeping. The development of bee-keeping in the province of Quebec needs not capital so much as experience in handling bees, and education in the modern methods of bee-keeping. Good work has been done by the Quebec Bee-Keepers' Association, and by the bee inspectors appointed by the Provincial Government. The amount of honey lost

in the province for want of bees to gather it is sufficient to provide a large and profitable export trade. The demand for honey in the province and in Ontario is, however, so good that very little has yet been exported overseas.

Helpful Legislation.—The legislation enacted by the Provincial Government has done much to aid the development of this branch of agriculture. The bee-keeper whose hives are destroyed by foul brood is partly indemnified and provision has been made for the appointment of apiary inspectors. Every year pure-bred Italian queen bees are distributed at half the usual cost price and arrangements have been made for ascertaining in more detail the most suitable regions for the industry.

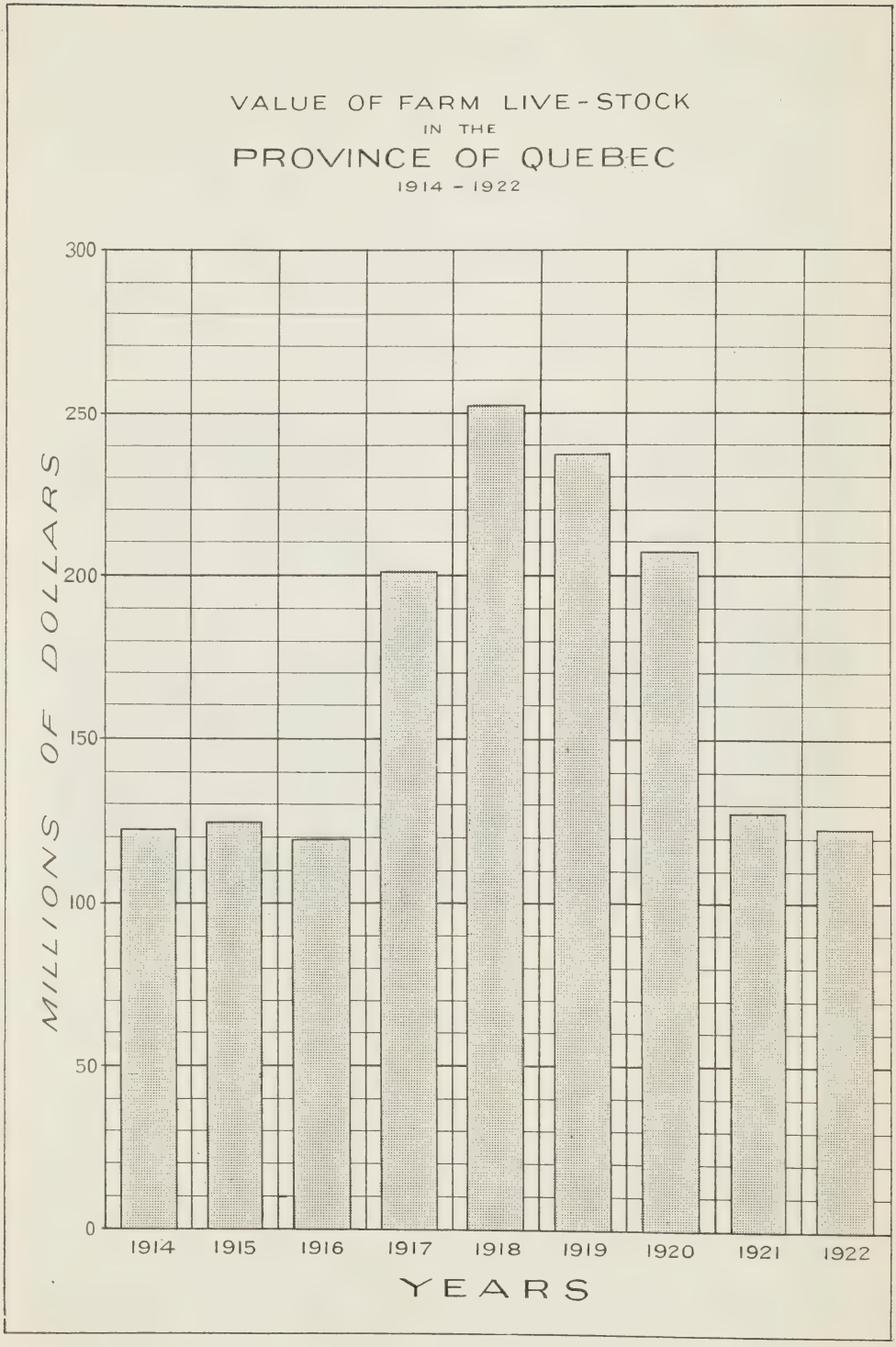
Courses of instruction are given under the direction of the Provincial Government at its apiaries at Levis, Montreal, and Joliette. These

AN APIARY IN BEAUHARNOIS COUNTY
Quebec provides ideal conditions for bee-keepers, of which there are over 7,000 in the province.

courses enable young bee-keepers to acquire knowledge which would take several years of practice to obtain and have been instrumental in increasing the number of apiaries.*

In the fiscal year ending in 1923, according to the provincial bee-keeping service there were 7,199 bee-keepers in the province. There were 83,989 colonies of bees kept and the honey extracted amounted to 3,025,041 lbs. Honey in the comb weighed 185,785 lbs, whilst 41,457 lbs. of wax was produced. Total value of honey and wax produced during the year was $1,983,351.

*_Bees and How to Keep Them_, published for free distribution by the Dominion Experimental Farm at Ottawa, will be found helpful.


VALUE OF FARM LIVE-STOCK
IN THE
PROVINCE OF QUEBEC
1914 - 1922
300
250
200
150
100
50
0
MILLIONS OF DOLLARS
1914
1915
1916
1917
1918
1919
1920
1921
1922
YEARS

LIVE STOCK

Natural Conditions Favourable.—The farms of Quebec have soils as good as can be found anywhere for the various types of live-stock farming. Although there are no extensive areas of ranch land such as those in the Canadian West, soil, climate and markets abundantly justify more intensive live-stock farming than is now practised. There are to-day thousands of farms in Quebec having luxuriant pastures with natural running water throughout the year, which, if run more systematically, could show much higher live-stock returns. The increased demand for live-stock products due to the war gave a decided impetus to the industry, which has been maintained despite the rather disheartening fall of prices since the conclusion of peace.

A comparative view of the increase of live stock in the province may be obtained from the following figures showing the growth from 1911 to 1922:

INCREASE IN NUMBER OF LIVE STOCK IN QUEBEC, 1911-22

Kind	1911*	1916	1921	1922
Milch cows	754,220	639,805	1,039,389	1,006,992
Other cattle	699,049	535,693	1,013,105	851,398
Horses	371,571	332,628	406,959	368,590
Sheep	637,088	497,711	1,006,620	990,918
Swine	794,351	531,303	883,920	728,926

VALUE OF LIVE STOCK IN QUEBEC, 1911-22

Kind	1911*	1916	1921	1922
Milch cows	$29,377,810	$39,668,000	$47,812,000	$45,162,000
Other cattle	8,725,031	27,052,000	23,301,000	19,651,000
Horses	48,713,535	38,252,000	36,219,000	37,023,000
Sheep	2,710,285	5,226,000	6,040,000	7,587,000
Swine	5,399,535	9,032,000	14,143,000	13,664,000

Swine Raising.—The dairy industry, which is especially dealt with in the next section, has made notable progress. Closely allied with it is that of swine raising. The bacon industry is practically in its infancy in the Eastern Townships. It is only within the last few years that serious attention has been given the production of bacon for export. In addition to its strategic situation in relation to the European and United States markets, the province of Quebec has, at Montreal, the greatest local market in Canada.

The Federal and Provincial Governments have contributed very material aid in recent years to the live-stock industry. Assistance is given mainly through farmers' co-operative organizations in the purchase and distribution of pure bred sires, including horses, cattle, sheep, and swine.

*Figures for this year taken from the Dominion Census of 1911.

Inspection, marketing and transportation are also receiving their full share of assistance, thereby bringing live-stock products in ever-improving condition to the consuming public.

POULTRY RAISING

A New Breed Developed.—Despite its rather rigourous winter climate, the province has a thriving and profitable poultry industry. The growth of urban centres of population of recent years has contributed much to the prosperity of this industry. The monks of the Agricultural Institute at Oka have developed a new breed of chickens, the Chanteclere, especially adapted to withstand a cold climate. The number of poultry of all kinds in the province increased from 3,537,860 in 1920 to 6,518,392 in 1922. In the former year the value of poultry was $4,947,400, as compared with $7,333,000 in 1922. The Dominion Bureau of Statistics estimates that there were 4,588,293 egg-producing hens in the province in 1922, producing 26,765,043 dozen eggs valued at $7,494,212.

FUR FARMING

Silver Fox Most Valuable Animal.—The climate of Quebec with its cold winters is admirably adapted to the raising of fur-bearing animals, and this province was one of the first to experiment in the comparatively new industry of fur-farming. The silver fox is the chief animal raised in captivity although mink, skunk, muskrat, raccoon and a few other animals have been domesticated on fur farms. Pioneers in the industry in Quebec are M. Johann Beetz, of Piastre Baie, on the north shore of the St. Lawrence, and Messrs. Holt Renfrew and Company, who have an up-to-date ranch near the city of Quebec.

The industry received two setbacks, the first due to over enthusiasm and over capitalization while in its formative stages, and the second due to the disruption of fur markets because of the war, but is now firmly established on a sound business basis founded on prices paid for pelts instead of as formerly, on the fabulous prices paid for breeding animals.

Number of Fur Farms.—There were 109 fur farms in Quebec in 1921, of which 104 were fox farms, compared with 80 establishments in 1920. The value of lands and buildings in 1921 was $173,204 and that of the animals, $430,607. Foxes born on fox farms in the same year numbered 993 and the total number of animals at the end of the year was 1,336. The number of fur farms increased to 153 in 1922, value of lands and buildings to $210,462, and the value of animals $454,549. Fox farms in that year numbered 143, having 1,701 foxes.

Mr. Ernest Thompson Seton, the well-known naturalist, says of the fur-farming industry: "I can see enormous possibilities for this work. I think that within ten years every enterprising French-Canadian farmer will have a small fur annex in his barnyard, and on the waste of the barnyard and the house raise valuable furs, enough to double his income."

DAIRYING*

A Long-Established Industry.—The first permanent introduction of dairy cattle on the continent of America, north of the Spanish settlements in Florida, was made by Champlain, the founder of Quebec. In his journal of the year 1610, he mentions the cutting of hay for the cattle, and a map of Quebec published in 1613 shows a place where "hay was grown for the cattle." The colony established a farm at Cap Tourmente and had sixty or seventy head of cattle there in 1629.

The number of cattle was increased by the French Minister, Colbert, under Louis XIV, who sent representatives "of the best dairy cows of Normandy and Brittany" to New France. De Tracy also brought some cattle from France when he came at the head of the famous Carignan-Saliéres regiment in 1665. Many of the cows in the existing herds of Quebec, and particularly the "French-Canadian" breed, which is the only registered pure breed that has been developed on this side of the Atlantic, have descended from these original stocks. As a matter of historical interest, it may be mentioned also that it was in the village of Ste. Marie de Beauce in the year 1882, that the first centrifugal cream separator was used on this continent.

From these beginnings the dairying industry has become well established in all the settled parts of the province; nearly every parish has its cheese factory and creamery. In 1922 there were 717 cheese factories,

PROGRESS OF THE DAIRY INDUSTRY IN QUEBEC, 1901-1921

——	1901	1911	1921
	Lbs.	Lbs.	Lbs.
Milk delivered at factories	863,775,734	1,889,071,709	1,104,758,499
Cream	11,222,748	1,501,460	70,830,886
Butter manufactured	24,625,000	41,782,678	48,630,403
Cheese manufactured	80,630,199	58,171,091	54,242,735
Butter, value of	$ 4,916,756	$ 9,961,732	$ 17,652,481
Cheese, value of	$ 7,957,621	$ 5,695,254	$ 9,197,911
Amount received by patrons	$ 11,039,379	$ 14,091,500	$ 23,093,640
Average amount received by each person	$ 109.50	$ 176·60	$ 285·20

734 creameries, 317 combined butter and cheese factories in the province. The annual production of creamery butter in the province in 1922 was 52,529,344 pounds, valued at $18,110,304. The production of factory cheese amounted to 39,679,901 pounds, valued at $6,307,581.

The quantity of butter produced on the farms, known to the trade as dairy butter, is larger than that produced in the creameries, but there are no exact statistics as to the total quantity, nor are there any figures available giving the quantities of milk and cream required for consumption in the towns and cities and also on the farms, but the value of the dairy butter and the milk and cream consumed or exported is estimated to exceed the

*Contributed by J. A. Ruddick, Dominion Dairy Commissioner.

THE DAIRY HERD AT OKA

The Trappist monks in the Agricultural Institute at Oka have been pioneers in agricultural experimentation. Their farm is one of the finest in the province. It was here the distinctively Canadian breed of poultry, Chanteclere, was originated.

value of the creamery butter and cheese and thus we have an estimated total value of dairy products for the province of approximately $65,000,000 annually, on the basis of present prices.

Favourable Climate.—The climatic and other conditions throughout Quebec are extremely favourable for the production of butter and cheese of superior quality. Eastern Townships butter has been the Canadian standard of quality for many years. Cheese made in parts of the province has a peculiar quality not found in the cheese from any other part of Canada. The extreme northern point of settlement, around lake St. John, is noted for the fine quality of the cheese it produces. In short, as good cheese and butter can be made in the province of Quebec as in any part of the world.

Opportunity for Expansion.—There is, of course, still room for improvement in quality, and there are great opportunities for expansion in the industry. The quality of the products will grade higher on the average when some of the smaller factories are combined to form larger and stronger establishments. This will permit of better equipment and the employment of more skilled workmen in the factories. By the testing of the dairy herds and the elimination of the unprofitable cows, a great increase is possible in the average yield of milk per cow. Greater care in breeding and better feeding would also result in an increase in the production of milk. These remarks apply to the other provinces as well as to Quebec.

In addition to the opportunities for increasing production in the older sections, there are new districts, especially in the northern part of the province along the Canadian National Railway and in the extreme east where the dairying industry may yet be developed on a large scale.

Government Aid.—The Provincial Government, through its Department of Agriculture, has a well-organized service to give instruction and advice to the operators of cheese factories and creameries, and for helping in every way to develop the industry. The Department of Agriculture at Ottawa employs special officers, with an intimate knowledge of the province, in order to give every assistance possible which is consistent with federal functions.

A recent enactment of the Provincial Government provides for the payment for milk delivered at factories according to the amount of butter fat it contains. Tests must be made by a duly qualified inspector from the Provincial Dairy School at St. Hyacinthe, and a register must be kept of all tests made. This enactment does not apply to dairymen who sell milk for use in its natural state only.

Co-operative Marketing.—An important movement in the province of Quebec in connection with the marketing of cheese and butter is represented in La Co-operative Fédéré de Quebec. The volume of business transacted through this organization grows steadily, and results appear to

CHARACTERTISTIC SCENES ON QUEBEC FARMS

be satisfactory to those connected with it. Under the rules of the organization the factories pay a nominal fee to join the co-operatives and undertake to send all their butter and cheese to the society's warehouse at Montreal, where it is graded and sold by auction to the highest bidder.

There is no danger of over-production in dairy products. Canada has full access to the world's best market, namely, the United Kingdom, and our position in that market is improved as we increase the quantity of our exports. Canadian cheese leads all other imports on the British market in point of quality, and has become recognized as the standard article. The weakest feature of the Canadian butter trade with the Mother Country lies in the comparatively small quantity which we have for export and the irregularity of the supply. If we had ten or twenty times as much butter to export our position would be better, and a relatively higher price could be obtained for the butter in that market, because the

AYRSHIRES ARE FAVOURITES WITH QUEBEC DAIRYMEN
This is a typical farm scene in the Eastern Townships, where dairy farming has become a specialty.

English dealer demands a steady supply of uniform quality, so that he may always be assured of having the kind of butter that his customers have become accustomed to. The fact that Danish butter of uniformly good quality is available throughout the year in large quantities is what gives it its strength in the markets of Great Britain. There is every encouragement, therefore, for the province of Quebec to extend the dairying industry to the greatest possible extent.

CHAPTER IV

Forests

THE forests of Quebec have always been classed among the most valuable resources of the province. During the French regime the correspondence of the Intendants with the Government in France is replete with reference to the timber wealth of the new land and frequent mention is made of the trade, both actual and potential, in masts, spars, ship timbers and other forest products. Later, when the woods were more fully exploited, there emerged the romantic figure of the river driver, that hardy, danger-loving French Canadian who, with pike pole and deftly balanced foot, rode the booms of logs over river and rapid to mill or to tidewater. In the past generation the magnificient white pine of the province constituted the most valuable forest type, but the best stands of this tree have now disappeared before the lumberman's axe, and the pulpwood species, principally spruce and balsam, are assuming a leading position. The decreasing supply of timber generally throughout the world has resulted in gradually rising prices, and in Quebec, as elsewhere, forest products are becoming more valuable. In 1920 their value amounted to no less than $86,422,729. The merchantable forests of the province are valued at approximately $600,000,000 and cover an area of about 130,000,000 acres. They constitute an important source of provincial revenue, and from 1867 to 1922 those under license brought in a revenue of no less than $54,875,340.

FOREST AREAS

Northern Areas.—The extreme northern portion of the province, that is to say, the region north of the 55th parallel and covering Ungava and the northern part of Labrador, is practically devoid of tree growth, and corresponds in character to the tundras of Siberia. Immediately south of this is the sub-arctic region constituting the forests of the Hudson Bay and Labrador basins not included in the arctic zone. In area it comprises about 180,000,000 acres, not more than one-sixth of which has merchantable timber on it. The country is rolling and is covered with small lakes and streams, whilst muskegs are numerous. Since the climate is severe, the period of vegetation continuing not more than five months, the trees are much smaller than those farther south and the species are few in number, the principal ones being the spruces, balsam, tamarack, aspen, balm of gilead and paper birch. Although these forests are at present difficult of access they form a large and substantial reserve that will ultimately be utilized.

The forests of the temperate zone comprise the second region. They contain the bulk of the valuable merchantable timber for which Quebec is famous, and may be sub-divided into three types, the Laurentian, the St. Lawrence and the Allegheny.

Laurentian Area.—The Laurentian forest area is estimated to contain 75,000,000 acres. and lumbering operations have been carried on for more than a hundred years. This country, which attracts so many tourists, is well supplied with beautiful lakes and rivers well adapted to

IN THE LUMBER WOODS IN WINTER

Immense quantities of logs and other forest products are taken out of the woods in the favourable winter season. French-Canadians are expert woodsmen.

log driving. The principal species are spruce, pine, cedar, tamarack, maple, birch, ash, elm, basswood and poplar. With the gradual removal of white pine and the spruces, the hardwood species, which are flotable only for short distances, are assuming greater importance in the stand.

St. Lawrence Area.—The forests of the St. Lawrence plain occupy both sides of the St. Lawrence river. In former days white and red pine formed an important part of the stand. The clearing of land for settlement has confined the forest to the less valuable agricultural soils. The species now found are: maple, birch, beech, basswood, elm, ash and oak mixed with pine, spruce, tamarack and hemlock, and cedar.

Allegheny Area.—The Allegheny forests are confined to the Notre Dame and Shickshocks mountains and extend from the Eastern Townships to the peninsula of Gaspé. Their area is approximately 20,000,000

acres, with red spruce and balsam forming about 60 per cent of the stand; cedar, tamarack and some hardwoods also occur. With two or three exceptions, the region is not well supplied with flotable streams.

FOREST WEALTH OF QUEBEC

The following estimate of forest wealth of Quebec has been prepared by the Forest Service of the province after careful investigation:

Species	Billion Feet B.M.
White and red pine	30
Spruce, balsam, hemlock, and other resinous trees except cedar	125
Cedar ((Arbor vitae)	20
Pulpwood	100
Hardwoods*	35
Total	310

As already stated, the forests of Quebec are estimated to be worth approximately $600,000,000.

TENURE OF FOREST LANDS

Classified according to ownership, the forests of the province containing commercial timber are listed as follows:

Private forests	6,000,000	acres
Forests on lots granted to settlers who have not yet acquired clear title	1,300,000	"
Leased forests or timber lands	46,000,000	"
Township reserves set aside for use of farmers	200,000	"
Unleased forests in possession of the Crown	76,500,000	"
Total	130,000,000	"

Private Forests.—Private forests are located principally in the central St. Lawrence valley. They consist of farms sold to settlers by the government, old seigniories alienated during the French régime, and lands given to railways in aid of construction. Forested lands suitable for agriculture are sold by the government in lots averaging about 100 acres to settlers who are given clear title by letters-patent on the fulfilment of stipulated conditions.

Leased Timber Limits.—Timber limits are leased by the Government after being advertised for at least thirty days. Leases are disposed of by auction to the highest bidder. The successful bidder has to pay a bonus agreed upon at the auction and, in addition, a ground rent of $6.50 per square mile—to be increased to $8 a square mile after 1923—and stumpage dues for all the timber cut. He also agrees to make periodical returns to the Forest Service respecting the timber cut, to avoid needless waste in lumbering operations and to protect his leasehold against fire.

*R. O. Sweezey, the well-known forest engineer of Montreal, in his *Timber Lands and Water Powers of Quebec* estimates the hardwoods at 5 billion feet.

FORESTRY MAP
OF
QUEBEC
Scale of Miles
20 0 40 80 120 160 200
Legend
Forest Land under license to cut Timber
Boundaries of Forest Reserves and Parks
Northern limits of Forest Trees
Pine
Active Pulp Mills
Paper Birch
Balsam Fir
Poplar
White Spruce
Black Spruce
Tamarack
Jack Pine
Cedar
Black Ash
White Pine
White Elm
Red Pine
Yellow Birch
Red Oak
Basswood
Beech
James Bay
Eastmain River
Rupert River
Big River
Lake Mistassini
Lake Mishikamau
Lake Melville
Hamilton River
Michikun Lake
Attikonak Lake
Ashuanipi Lake
Ishimanikuagan Lake
Natashkwan River
Romaine River
Clarke City
ANTICOSTI ISLAND
NEWFOUNDLAND
Grand Falls
St. Amedee de Peribonka
Chandler
Riviere du Loup
Old Lake Rd
Rimouski
Kenogami
Chicoutimi
Bagotville
St. Lawrence River
NEW BRUNSWICK
ONTARIO
UNITED STATES
Prepared by the Natural Resources Intelligence Service

Diameter limits are imposed to prevent cutting of immature trees. Another important and far-reaching provision of the license is that all timber cut must be manufactured in Canada. This has stopped the export to foreign countries of pulpwood and logs cut from such areas, and has contributed very largely to the phenomenal growth which has characterized the pulp and paper manufacturing industry in Quebec during the past decade.

Township Reserves.—There are seventeen township forest reserves. These are non-agricultural forest lands set apart to supply timber and firewood to the near-by inhabitants under special regulations.

Unleased Forests.—The unleased forests are in absolute possession of the Government, and are free from all incumbrance. They are situated chiefly in the northern part of the province—in the basin of the St. Lawrence, as well as in that of Hudson bay. No cutting has yet been done on any of these vast territories. Fire, storms, insects, and fungi, however, cause considerable damage every year; and, as in all northern forests, the growth in the volume of the trees is very slow. Therefore, the annual increment in volume is very small. The Forest Service is engaged in making an inventory of them so that they may gradually be utilized as the country's needs require. The timber in these forests consists chiefly of spruce, balsam fir, poplar, and banksian pine; the quantity per acre varying between three and fifteen cords, mostly of pulpwood. This reserve can furnish millions of cords of pulpwood and, as there are considerable water-powers on most of the streams, it can easily be foreseen that pulp and paper mills will eventually be erected there.

FOREST AND WOOD-USING INDUSTRIES

Lumbering.—Large and important industries are based upon the raw materials obtained from the forests of Quebec. In 1921 according to the Dominion Bureau of Statistics there were 649,334 thousand feet, board measure, of lumber cut in the province, valued at $19,656,462. Other products and by-products of the sawmill, such as lath, shingles, cooperage stock, etc., brought the total value of products of this industry to $23,629,093. The net value of products of the pulp and paper industry for 1921 was $69,335,298 making a total of $92,964,391 for the products of two most important industries using forest products as their raw material. The total value of the primary forest products of the province including logs for lumber, pulpwood, ties, poles, piles, firewood, mine timbers, etc., for 1921 was approximately $57,000,000. There were during 1921, according to the Dominion Bureau of Statistics, 1,457 sawmills and 261 major logging operations in the province, aggregating more than in any other province of the Dominion. The total capital used in the lumbering industry was $56,767,884, whilst 14,638 persons were given employment, to whom, in salaries and wages, there was paid the sum of $11,253,100.

STEPS IN MAKING NEWSPRINT

The great dailies of the United States and Canada look to the woods of the north for their supply of paper.

Pulp and Paper.—Canada's first paper mill was established at St. Andrew's, Quebec, in 1803, and, ever since, the province has continued in the forefront of the pulp and paper industry. It was not, however, until the decade from 1860 to 1870 that ground-wood pulp making obtained a footing in Canada, so that the present huge industry is not more than 50 years old. In 1922 there were 47 pulp and paper mills in Quebec, compared with 104 in all Canada. The capital invested in the industry was $191,514,809, or 50 per cent of that in the whole Dominion. The quantity of pulpwood used increased from 255,943 cords in 1908 to 629,934 cords in 1913 and to 1,405,440 cords in 1922, whilst the number of tons of pulp produced increased from 201,450 in 1908 to 1,088,205 in 1922. Paper manufactured in 1922 amounted to 587,777 tons. Both in pulpwood consumed and in pulp manufactured, Quebec stood first among the provinces of Canada and second in tonnage of paper produced.

A list of the pulp and paper mills, showing the location, nature of product and daily output of each is shown as Appendix III.

Methods of Manufacture.—To the development of chemistry and engineering the remarkable progress in the industry generally is in the main due. The discovery of the three chemical methods for the reduction of wood fibre, the sulphite process, the soda process and the sulphate, and the use of the bleaching power of chlorine have made possible the use of a large variety of woods, while the invention of new machinery and the phenomenal extension of hydro-electric power have made it possible to meet the ever-increasing demand.

Natural Advantages.—In the production of pulp and paper Quebec bids fair to continue her lead among the provinces. When a ton of paper requires a cord and a half of wood and one hundred horse-power for its manufacture, it is only a land of forest and stream that can compete. Quebec's natural resources of spruce and balsam amount to more than two hundred and fifty million cords; her water-power, as seen on another page,* is nearly seven million horse-power, scattered broadcast, of which not a million has yet been developed; her geographical position, too, is unequalled in Canada for filling the needs of Europe and the United States for products of the forest.

Foreign Capital Interested.—Capital also is ready to take advantage of Quebec's opportunities. Within the last twenty-five years many millions of United States dollars, as well as some British capital, have been invested here and have been largely used in building up the various manufacturing centres located along the banks of the St. Maurice and other rivers. Notable examples are Shawinigan Falls, La Tuque and Grand Mère on the St. Maurice, Chicoutimi and Kenogami on the Saguenay, Windsor Mills and Bromptonville in the Eastern Townships, and Kipawa on lake Timiskaming.

*See page 80.

Must Be Manufactured in Canada.—A potent factor in this industrial development has been the legislative enactment of the Quebec Government in 1910, under which all pulpwood cut on Crown lands in the province must be manufactured into pulp within the Canadian boundary. The result has been that, whereas the proportion between the raw pulpwood exported and that manufactured in Quebec mills was as 69 per cent to 31 per cent in 1910, in 1922 the figures, more than reversed—26 per cent to 74 per cent. It is the private forests, mainly in the Allegheny zone, that furnish most of the pulpwood exported to the United States.

Allied Industries.—A group of important industries has grown up based on the pulp and paper making industry. The materials made by these include building, sheathing and roofing papers, stationery goods, waxed and oiled papers, wall paper, fly paper, paper patterns and various other products. There were 33 such establishments in Quebec in 1921 producing goods to the value of $7,215,879 and employing $6,595,167 capital in their operation. Abundant supplies of raw material, and a reliable supply of labour contribute to the advantages the province offers for the establishment of these subsidiary industries.

Destructive Distillation of Wood.—The great need of acetone as a solvent in the production of cordite for the manufacture of explosives during the great war stimulated in a marked degree the development of the destructive wood distillation industry, so that it now ranks fourth among the different wood-using industries of the province.

The first factory in Canada for the distillation of wood was built in New Brunswick in 1880 and operated till 1886. At present there are twelve factories in Canada, four of which are located in Quebec. These are "crude" mills; that is, the products are not refined at them, but are sent to a central refining plant at Montreal. The Standard Chemical, Iron and Lumber Company, Ltd., operates both crude and refining mills and controls all but two of the distillation plants active in Canada. The crude mills are moved about where the supplies of wood are available.

Waste Products Used.—The woods mostly used are birch, beech, maple, oak, and ironwood, and for the most part only material unsuitable for the manufacture of lumber is used, being such as would be cut for cordwood, or wasted in lumbering operations. All portions of the tree are used, even to the small branches, and any piece larger in diameter than five inches is split to admit of the easier penetration of the heat of decomposition and the freer evolution of the gases. Mill slabs, edgings, etc., can also be used, but decayed wood is rejected, as the charcoal from it is a source of danger owing to its liability to spontaneous combustion.

The capacity of the four plants in the province is 168 cords per day. The wood is cut into about four-feet lengths and is seasoned for a year or more to dry it out. When ready for distillation a cord weighs about 3,700 pounds.

Materials Produced.—The products of these crude distillation plants are gases, crude wood alcohol, acetate of lime, creosote, oils, hardwood tar, and charcoal. The gases and hardwood tar are burnt under the retorts, part of the creosote oil is also burnt while part is sold in the form of oil. A new use has recently been found for the oils, some of them having been demonstrated as a result of experiments made by the Forest Products Laboratories of the Forestry Branch in co-operation with the Mines Department, to be suitable for the flotation process of extracting ores.

Crude wood alcohol is refined by fractional distillation to produce methyl alcohol and methyl acetone, or acetone-alcohol solvent in various grades to suit market conditions. Formaldehyde is also manufactured from the methyl alcohol. Acetate of lime is sometimes exported as such, but for the most part is converted into acetone as a solvent in cordite manufacture or into acetic acid, a portion of which is further converted into acetic anhydride and methyl acetate.

The charcoal is sold for domestic fuel or for making charcoal iron. With the development of the steel industry in Canada, the demand for charcoal will undoubtedly be materially increased. The valuable products are wood alcohol, acetate of lime, acetone, and charcoal, and recently the oils have been added to the list.

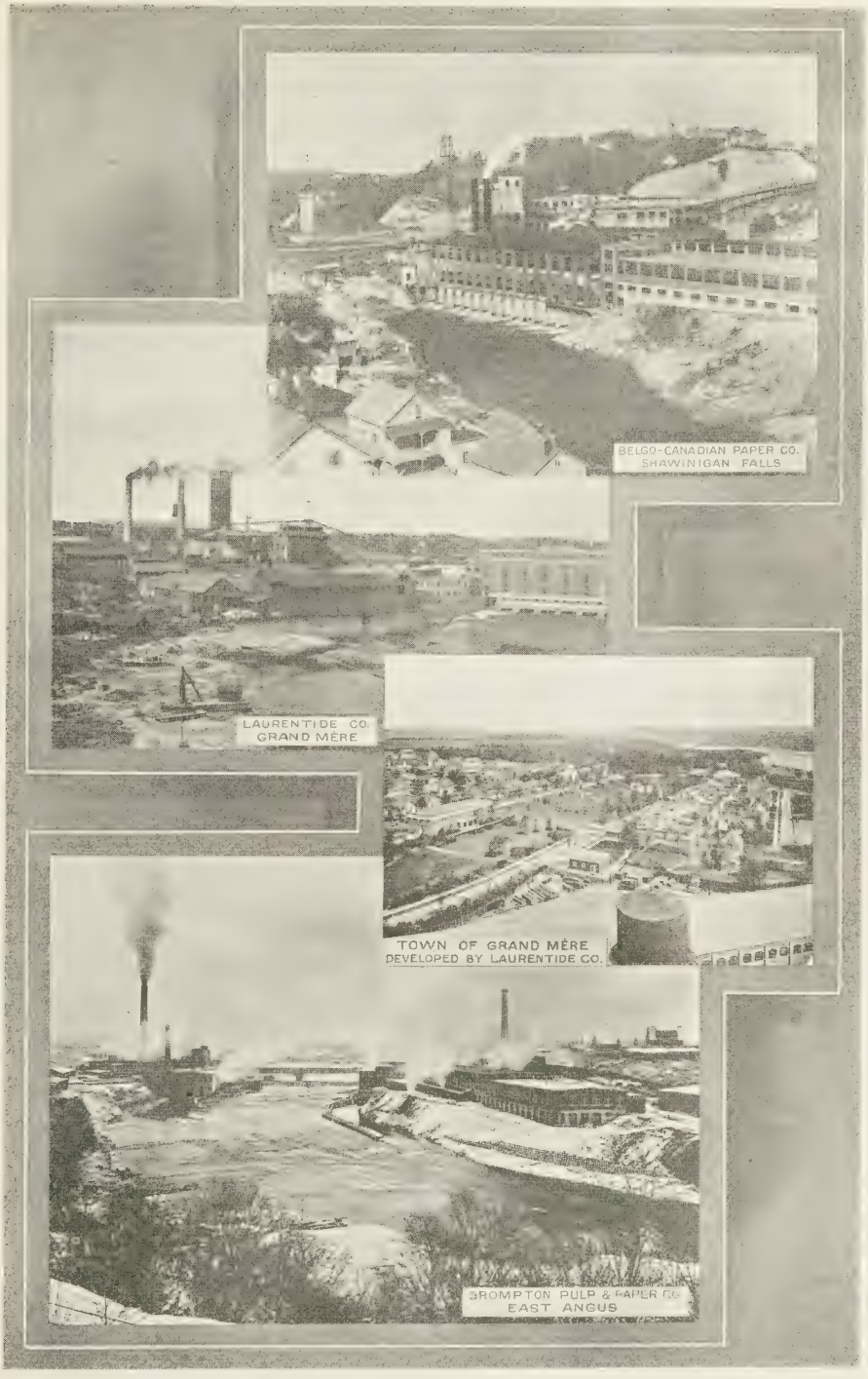
The production per cord unit of the valuable products is about as follows: Crude wood alcohol, 6 imperial gallons; acetate of lime, 200 pounds; charcoal, 1,000 pounds (50 bushels of about 20 pounds).

In addition to these main products, the gases form 15 to 20 per cent of the weight of the original wood. The creosote oils separated during redistillation amount to 2 to 3 imperial gallons per cord, and the hardwood tar amounts to about 16 imperial gallons per cord.

The rapid development of wood distillation presents a good opportunity for the economical utilization of a great deal of the hardwood waste in the wood-using factories, especially where it is produced in large quantities, and from factories which are situated within a reasonable distance of the wood distillation plants.

Other Wood-Using Industries.—There are numerous other industries using sawn lumber and the products of the sawmill as their raw material. Chief among them are the sash, door and planing mill industries. These, comprising many establishments, manufacture dressed lumber, house finish, sash, doors, blinds, and other building materials. The value of the products made by these industries in Quebec in 1921 was $8,512,461, and the capital employed, $11,243,771.

Under the same general classification come the industries manufacturing furniture, boxes and box shooks, vehicles and vehicle supplies, lasts and pegs, coffins and caskets, boats and canoes, spools and bobbins, woodenware, cooperage, handles, clothes pins, patterns, show-cases, spinning wheels, baskets, wooden pumps and other similar products. There were 313 of such establishments in Quebec in 1921 employing



QUEBEC CONTRIBUTES LARGELY TO CANADA'S PRIMACY IN THE PULP AND PAPER INDUSTRY

$10,467,527 in capital and turning out products valued at $10,308,555. There are, of course, a large number of other industries in the province that use wood or lumber as a less important part of their raw material.

Splendid openings exist for the establishment, especially, of industries utilizing hardwood, of which the province has abundant supplies.

FOREST ADMINISTRATION

Provincial Jurisdiction.—The Department of Lands and Forests of the Provincial Government administers the timber resources of the province. Timber lands are leased virtually in perpetuity to license holders, the Crown retaining title to the land. In the districts where the timber is to a large extent alieniated, the fire protection is maintained by associations of licensees and timber owners, the Government defraying part of the expense. A "close season" for burning brush and dèbris is enforced. As stated previously, the export of unmanufactured timber is prohibited from material cut on Crown lands. The regeneration of the forest is encouraged by judicious cutting regulations.

Forest Service.—A Forest Service, established in 1893, is the agency through which the Department of Lands and Forests carries out its forest policies. This service has charge of the administration of timber lands and all matters relating to forestry. It is headed by a chief and an assistant chief, and consists of some twenty or thirty forest engineers, two civil engineers and a non-technical field force of rangers and cullers. It has charge of the exploration of the unsurveyed territory in the province, the classification of soils, the supervision of lumbering operations on Crown lands, reforestation and all other technical work of the Department in connection with forests.

School of Forestry.—The School of Forestry in the city of Quebec is closely connected with the Forest Service. It was founded in 1910 by the Provincial Government, and has for its purpose the training of men for the Forest Service and private practice. It has been combined with the School of Surveying and is now known as *l'Ecole d'arpentage et de Génie forestier*. Following this amalgamation, the course has been increased from three to four years' duration and now leads to diplomas in both sciences. The *diplome d'Ingenieur-forestier* gives its holders right to admission to the Canadian Society of Forest Engineers and the Association of Forest Engineers of the Province of Quebec. The holder of a *diplome de bachelier en arpentage* must undergo further examination by the Surveyors' Corporation before being permitted to practise as a surveyor. The school is affiliated with Laval University at Quebec and the instruction is given chiefly in the French language, although applicants for admission must be able to read and write English correctly.

Practical work is arranged for at the government forest nurseries and in forests and mills near the city of Quebec. All students at this school, but more especially those studying forestry, are employed by the

Quebec Government during their summer vacations, and on graduation are either employed permanently by the Quebec Government or assisted in obtaining employment elsewhere.

School for Paper-Makers.—Realizing the need of teaching the art of paper-making to assure expert workmen and an adequate supply of trained paper-engineers, the Quebec Legislature established a school of paper-making in November, 1923, at Three Rivers, in the centre of the paper-making industry in Canada. A four-year apprentice course is given students, who work in the mills during the afternoons and pursue their studies in the mornings. Night classes are also provided for those who cannot take the day courses, whilst technical courses are offered to those who wish to go more into detail in the art of paper-making. It is further planned to give post-graduate courses to those desiring to specialize in particular branches of the industry.

The establishment of a forest research bureau has been authorized by the Legislature and it is expected this will be organized in 1924.

Forest Rangers School.—A school for forest rangers was established in September, 1923, at Berthierville, where the provincial forest nursery is located. Studies extend over a period of two years, the students attending lectures twice a year at the school for a period of two months and then for four months pursuing practical work throughout the province at such tasks as forest ranging, log scaling, fire ranging, driving, nursery work, and mill work. During this practical work, students are paid a small salary. Tuition is free.

Forest Reserves.—In Quebec, the Provincial Government, sensible of the fact that the day is approaching when the depletion of forest resources will result in a scarcity of, and high prices for, forest products, has established forest reserves in large areas. In fact a larger area has been set aside for this purpose in Quebec than in any other province. Many of these are also fish and game reserves. The total area set aside as provincial forest reserves is 168,746 square miles. The only reserve in existence in the province in 1905 was the Laurentides National Park, which is predominantly a fish and game reserve. Since then there have been established: Gaspé Park, 2,523 square miles; Rimouski Reserve, 1,250 square miles; Chaudiere Reserve, 156 square miles; Temiscouata Reserve, 227 square miles; Labrador Reserve, 110,000 square miles; Barachois Reserve 113 square miles; St. Maurice Reserve, 27,652 square miles; and Rivière-Ouelle Reserve, 340 square miles.

Fire Prevention.—The first essential of an effective forest policy in a country like Canada, where competent forest engineers have estimated that the annual destruction of timber by fire exceeds the annual cut, is the establishment of a system of fire prevention. About half a century ago the whole of the Saguenay region, comprising close to 20,000,000 acres,

was devastated by fire. These conflagrations, started by the carelessness of a camper, the spark from a locomotive or the thoughtlessness of a settler, often assumed the proportions of veritable calamities, destroying human life as well as property. Up to 1883 nothing had been done by the Quebec government to guard against them, but in that year the legislature passed legislation providing for the creation of a system of protection against forest fires.

Co-operative Protective Associations.—This system has been gradually improved until the province now has one of the best fire protection organizations in Canada. As at present constituted it consists of two parts; that consisting of the patrolling of railway lines and the enforcement, by the Forest Service, of the safeguards provided by forest fire legislation, and that established by the limit holders who, by the terms of their leases, are compelled to provide protection on the lands which their licenses cover. Fire protection on licensed lands is carried out individually by the licensees or by means of co-operative forest protective associations. Four such organizations have been formed in Quebec, which now patrol some 60,000 square miles of privately held timber lands. The total patrol staff of these four organizations exceeds five hundred men. The four co-operative associations which have been incorporated as limited liability joint stock companies are the Laurentian Forest Protective Association, the Ottawa River, the St. Maurice, and the Southern St. Lawrence. One hundred and fifty-eight limit holders constitute the membership, and the disbursements in 1922 were $439,330, One thousand and eight fires were extinguished in that year. Air-planes are now being used quite extensively in forest patrol work.

Reforestation.—So large and impressing has the fire danger to forests in Canada seemed that it is only of recent years that governments have given much sustained attention to reforestation. The outstanding problems in connection with reforestation in Quebec are: first, a supply of seedlings; second, the planting of waste lands which are estimated to comprise over 3,000,000 acres; third, the reforestation of cut-over and burned timber limits, of which it is estimated at least 4,000,000 acres now require treatment, and lastly, the awakening of public opinion to the importance of this work and the encouragement of local tree planting organizations.

A forest nursery was established at Berthierville in 1908 to provide planting material for distribution, and for the re-planting projects of the Forest Service. Not only indigenous trees are raised, but a systematic study is made of all trees growing in this latitude. The nursery has a stock of 4,000,000 plants and to date has shipped out more than 3,500,000 trees. Limit holders are beginning to plant, and the demand from private owners is becoming very large. An additional demand arises from the fact that provision is made by legislation for the creation of township

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A MOUNTAIN OF PULPWOOD

This pulpwood at Hull, Quebec, has been floated down the river in the open season and is stored ready for grinding into pulp during the winter.

communal forests, and settlers and others are encouraged and assisted to devote a part of their holdings to timber production. For each acre of land planted with forest trees the owner is entitled to a land order good for twelve dollars on the purchase of public lands.

Reclaiming Waste Land.—One of the first experiments in reclaiming waste lands in Quebec by means of tree-planting was begun in 1889 at Oka by Father Lefebvre, a Sulpician priest, who succeeded in reforesting eighteen acres of shifting sands. This plantation consisted mainly of white pine and spruce wild stock, but it has grown so well that many of the trees have now a diameter of 9 to 13 inches and a height of some 45 to 70 feet. These dimensions would be greater had judicious thinnings been made.

As in Ontario, the planting of the Forest Service has been devoted mainly to the reclamation of areas of "blow" sand, although a considerable area of cut-over land has also been replanted. At Lachute, a tract of 300 acres of shifting sands has been reclaimed, partly by planting and partly by the sowing of beach-grass. Near Berthier Junction similar work is in progress.

Private Companies Interested.—Particularly good work in reforestation is being done by private companies engaged in the lumbering and pulp industries. The Laurentide Company at Grand' Mère were the pioneers in this, and in 1919 planted a million trees, and transplanted a million and a quarter. Price Bros. & Company, Quebec, have established a nursery and have set out 300,000 transplants, whilst the Riordan Pulp & Paper Company, Montreal, planted 75.000 trees in 1919.

The regeneration of the forest in Quebec is also encouraged by the cutting regulations, and as the Forest Service administers the timber lands and disposes of the timber, it is in a position to direct the methods of utilization. About 3,000 lumber camps are supervised by Forest Service officials and a much closer utilization, together with an improvement in silvicultural conditions tending to encourage natural reproduction, has resulted than where administration of timber lands and cutting is not part of the work of the Forest Service.

CHAPTER V

Minerals

QUEBEC stands fifth among the provinces of Canada in the value of minerals produced. Although she possesses vast potentialities in the mineral kingdom, comparatively little has been done as yet to ascertain the extent of her resources. So wide is the field that it will perforce take many years even to approximate the value hidden under ground.

Mineral Potentialities.—"The province," says an authority,* "has by far the largest share of the great pre-Cambrian shield, which fills ninety per cent, if not more, of the entire province. Cobalt, Porcupine, and some of the newer discoveries already referred to, are near the Quebec boundary. Geological formation and ore deposition bear no relation to interprovincial boundaries established by man. But Quebec has not yet seriously turned her attention to the exploration and geological mapping, much less to the prospecting, of this huge area. The attention of her mining men has so far been largely directed to the rich mineral deposits of the Acadian Highland, which occupies the Eastern Townships and Gaspé peninsula, and in which asbestos, chrome, copper, lead, zinc and gold ores, as well as other valuable minerals have been found. There is no reason to doubt that enormous treasures in minerals in this area await discovery by the thrifty people of this province, whose well-known pioneering ability, which has been so successful with the axe and the canoe, will prove to be equally successful when their keen natural aptitude is specially trained and turned to the search for minerals in this great northland of their province.

"Let us try to estimate even more broadly the probable significance to mining of this enormous region surrounding Hudson bay, with an area of 2,000,000 square miles, occupying considerably over one-half the entire surface of Canada. A little is known of the general geology and ore deposits of scattered areas, totalling not more than ten per cent of it, and in this smaller area the detailed geology has been worked out over only a few hundred square miles, near important discoveries. But beyond this small fraction only a few intrepid explorers have crossed the Archean area here and there, following the lakes and streams. These agree that the general age and formation of the rocks revealed along these routes of exploration are similar to those already examined in greater detail. But beyond these broad statements, not even general outlines of the geology of most of this vast territory have been accurately worked out. Fortunately, enough is known to make reasonably certain that the broad average

*Dr. C. V. Corless, in his presidential address to the Canadian Institute of Mining and Metallurgy, March, 1922.

formations of the less-known parts will closely resemble those of the parts already more fully examined. In the only parts where any detailed geological examination and prospecting have been carried out, there have already been discovered the fabulously rich deposits of iron, copper, nickel, gold and silver, already alluded to, containing many thousands of millions (billions) of dollars in gross value of these metals."

Diversified Geological Formations.—It is stated that approximately only 5 per cent of the area of Quebec has been investigated for minerals, and at that only superficially. The very diversified nature of the geological formations are indicative of great latent mineral wealth. North of the St. Lawrence the rocks of the pre-Cambrian system, including the Keewatin, Laurentian and Huronian formations, prevail. These contain gold, silver, nickel, lead, copper, iron, zinc, apatite, mica, graphite, molybdenite, feldspar, and magnesite.

South of the St. Lawrence, in the Eastern Townships, the formation is paleozoic and embraces the Cambrian, Chazy, Trenton, Utica, Lorraine, and Devonian beds, which are frequently penetrated and intruded by rocks of igneous origin, such as the Montreal mountain and Mount Beloeil and the wide serpentine belt crossing the counties of Brome, Shefford, Richmond, Wolfe, and Megantic. Rocks of sedimentary origin are numerous and furnish excellent building stone, while the shales and slate supply materials for the manufacture of bricks and cement.

Value of Production.—The value of mineral production in Quebec has grown from $2,546,076 in 1900 to $18,335,153 in 1922. Under the stimulus of war demand and high prices it reached a peak of $28,392,939 in 1920. The production of metallic minerals is small as yet. The mineral of greatest aggregate value is asbestos, which constituted approximately one-third of the value of the minerals produced in 1922. Building materials also form a considerable portion of the production, and of these cement comes first with a production in 1922 of 2,660,810 barrels valued at $5,906,998. Next in value to asbestos and cement is brick, valued at $1,884,585, whilst limestone with a value of $1,631,116 comes fourth.

The following table gives an idea of the development of the mining industry in the province since 1910:

MINERAL PRODUCTION IN QUEBEC, 1910—1922

Year	Value	Year	Value
1910	$ 7,323,281	1917	$16,189,179
1911	8,679,786	1918	18,707,762
1912	11,187,110	1919	20,813,670
1913	13,119,811	1920	28,392,939
1914	11,732,783	1921	15,522,988
1915	11,765,873	1922	18,335,153
1916	13,287,024		

The striking increase in value during the years 1919 and 1920 shows the effect of high prices due to heavy war demand.

PRINCIPAL MINERALS

Asbestos.—Asbestos holds the premier position among minerals in point of value. In 1922 the production amounted to 176,350 tons, valued at $6,068,471, of which 105,114 tons, valued at $5,993,570, were exported as crude, fibre and paper stocks. Over 56,885 tons of asbestos sand and waste worth nearly $562,223 were also exported. Included in the foregoing, 16,011 tons of asbestic, valued at $15,403, were produced. The amount of ore mined to secure this amount of asbestos was nearly three million tons. The price of asbestos has a wide range averaging from $22 per ton for paper stock to $649 for the best first-class mineral.

The keen demand for asbestos during the war led to the re-opening in the East Broughton district of several mines, whilst the well-known mines at Thetford, Black Lake and Danville were worked to capacity. During 1922 thirteen companies operated eighteen mines, and prospecting and development work was done in three townships.

Though Canada has by no means a monopoly in the production of asbestos, inasmuch as the mineral is found in many parts of the world, the only serious competitors have been Rhodesia and Russia, and Russian production has practically ceased. The dominating position of Canada, however, is most marked, for, even in the year before the war, 87 per cent of the world's consumption of asbestos was provided by the province of Quebec, the remainder being practically all contributed by Russia and South Africa. Generally speaking, both the Rhodesian and the Russian products which are marketed are of longer fibre, but of lower textile quality than the Canadian; the blue asbestos of South Africa is inferior to that produced in Quebec.

Of the Canadian production 80 per cent is low grade, being made up of short and medium length fibres worth only about 5 per cent of the value of the superior grades, and a steady market must be found for it if the higher values are to be mined. The lowest grades of asbestos are made into asbestos paper, which is largely used in building and in making heavy mill-board which, in turn, is used for insulating electric switchboards. As this mineral enters largely into the composition of certain building materials which have to compete with others long established in the world's building trades, it is most essential everything should be done to encourage its use. The longer-fibred and more valuable material is used in the textile trades for such purposes as the manufacture of fire-proof clothing, theatre curtains and other fabrics.

That very little of the fibre is now manufactured in Canada is to be regretted. Most of it is shipped to Europe and the United States, which now supply the South American republics with asbestos products previously controlled by Germany. In fact, asbestos products at present are manufactured in Canada mainly for building material, but this utilizes only about 5 per cent of the total output, and that of the lowest grade. There are now in the province three establishments that manufacture finished

QUEBEC PRODUCES OVER FOUR-FIFTHS OF THE WORLD'S ASBESTOS

asbestos products. Fire-proof building requirements are admirably met by the shingles and wall-board made from mixing asbestos and Port'and cement. Realizing the growing importance of this trade one of the largest mine-owning companies contemplates building an up-to-date factory at Asbestos, near Danville, in the Eastern Townships for the manufacture of all kinds of articles made from asbestos, such as ready roofing, shingles, packing, pipe covering, textiles and brake-band lining.

The constantly increasing uses of asbestos, and the almost unlimited areas and depth of rock where it occurs in Quebec, will constitute one of the province's greatest resources for many years. The Provincial Government in 1917 placed a royalty of 2 per cent on the gross value of all asbestos mined and later this was increased, now standing at $2\frac{1}{2}$ per cent.

Feldspar.—This mineral is extensively used in the pottery industry and in the manufacture of high-tension insulators. Large deposits of a particularly high grade have for a number of years been mined in Labelle county, along the Lièvre river, and important new deposits have recently been discovered. With the discovery of these, the Superintendent of Mines for Quebec states that there is no doubt production will increase and that the mining of feldspar can be looked upon as a permanent industry.

These new deposits are located in Derry township, near the town of Buckingham. One deposit is a pegmatite dyke of almost pure feldspar, practically pure orthoclase. Another deposit consists of albite, the soda feldspar, and is used in the manufacture of scouring soaps and powders. Production of feldspar in 1922 was 12,472 tons, valued at $115,483.

Mineral Paints.—An industry of some importance is developing in the making of paint materials from natural iron oxide and ochre. The more important deposits of these are in the St. Lawrence valley, especially in the neighbourhood of Three Rivers. At Red-Mill the Canada Paint Company operates an extensive plant for calcining, washing and grinding pigments from its deposits. A variety of shades of red, umber, and sienna is produced.

The iron oxides found in Quebec may be subdivided into two classes, the raw oxides, which are marketed without any preparation, and which are used in the manufacture of coal gas as a purifying agent to absorb hydrogen sulphide, and the calcined oxides which are further treated for the manufacture of paints. The natural iron oxide deposits in the province are, as a rule, of very high grade. Much of the calcined material assays over 90 per cent iron oxide, and some of it reaches 98 per cent and over. There are numerous deposits of this high order. In 1922 7,381 tons of mineral paints, valued at $113,663, were produced.

Mica.—Quebec has practically a world monopoly in the production of the amber or phlogopite variety of mica, which is far more valuable than the white or muscovite variety, as it is more pliable, more elastic and is the best in the world for the construction of electrical apparatus. The

deposits are found north of the Ottawa river and between the valleys of the Gatineau and Lièvre rivers. The mica has hitherto been sent as mined to the United States to be manufactured. It could be manipulated in Canada, but one deterrent has hitherto been the competition of the Germans who used to buy the raw material in India and send the manufactured article to England for sale. In the British markets preference is given to the Indian mica because the Canadian dealers have not so rigid a standardization and grading of sheet mica prepared for foreign markets, the shipments often varying considerably from the standard submitted.

The larger sizes of mica bring a much higher price per pound, sheets four inches wide and six inches long selling for $2.50 per pound, whilst the smaller sizes bring as low as ten cents. During recent years more use has been made of the smaller sizes in manufacturing micanite composed of small pieces of mica and shellac which can be pressed into larger sheets, and cut and shaped to suit requirements.

The chief use for mica is for insulation purposes in the manufacture of electrical machinery. Stains, cracks and inclusions reduce both the usefulness and value of the large sheets. The invention of micaboard or micanite has rendered possible the utilization of what was previously regarded as worthless mineral on account of its small size. Sheets too small to make micanite are pulverized to make ground mica which has a number of uses, viz., to give a lustre to wall paper; as an adulterant in the manufacture of rubber and fireproof paint; as a fire-proof covering for pipes; as a lubricant when mixed with oils; for the manufacture of telephone receivers when mixed with hard rubber; and, mixed with shellac, for the manufacture of insulation for wires carrying high potential currents. Only the coarser grades of ground mica are used for this latter purpose. Scrap mica is used with light galvanized wire netting to make a flexible insulating web for boiler and pipe covering. A steam pipe in which condensation is represented by 100 when uncovered is reduced to 12 when covered with this insulating web.

In point of value mica stands fourth among the minerals of Quebec, being below asbestos, feldspar and mineral paints. The amount mined during 1922 was 890,547 pounds, valued at $91,001.

Graphite.—Graphite is found in almost unlimited quantities in the Laurentian rocks to the north of the Ottawa river, sometimes forming thirty per cent of the whole rock, but the average is eight to fifteen per cent. Though the graphite deposits are numerous and have been worked in the townships of Grenville, Buckingham, Lochabar and Amherst since 1847, great difficulty has always been encountered in the concentration of the graphite so as to eliminate the accompanying minerals, especially mica, and thus obtain a very pure product.

Over 75 per cent of the world's production of graphite is used in the manufacture of crucibles, the remainder being an ingredient of lubricants, paints, pencils, and polish. The claim is made by some manufacturers

that crucibles made with the flake graphite produced by the mines of Quebec are not so durable as those made with the Ceylon product, but experiments with both kinds show that practically no difference exists. On the other hand, some factories mix the flake and Ceylon product in the proportion of 3 or 4 to 1 claiming that crucibles made thus expand less and last longer than when made solely from one kind of graphite.

During the war the demand for crucibles and the lack of imports of graphite from Ceylon and Madagascar created a good market for the Canadian product, but since peace was declared large inventories and declining prices have materially lessened the demand. A better study of market conditions and delivery of a product up to standard will do much to restore the graphite industry to an economic basis.

In 1922, Quebec produced 47,327 pounds of graphite, as compared with 84,684 pounds in 1921 and 466,420 pounds in 1920.

Magnesite.—The mining of magnesite is another industry that presents great opportunities to the province. The largest and most important deposits of North America exist in Grenville township, Argenteuil county. As the great steel centres of the United States and Canada are in the East there is no likelihood of the Grenville quarries suffering competition from the magnesite deposits in the states of Washington and California. In pre-war times Austria and Greece practically had a monopoly of the magnesite trade. There is no reason why, if Canada takes advantage of the present opportunity, Austria and Greece should ever regain the dominating position they formerly held in the production of this mineral.

One of the recent developments in the magnesite industry has been the introduction of the dead-burning of magnesite in rotary cement kilns in a specially constructed plant at Calumet. The crude magnesite is ground to pass 100-mesh screens, is mixed with 5 per cent of ground iron ore and then sintered at a temperature of 2,400° F. in the kilns. The product which comes from the kiln is an excellent refractory material used for lining open hearth and high temperature electric steel furnaces. This material was considered very satisfactory by the users. In 1922 the production was 5,645 tons valued at $76,547.

Molybdenite.—Molybdenite mining has been very energetically pursued at the famous Moss Mine about three miles from Quyon station, considerable stimulus having been imparted by the war. Operations were not commenced until March, 1916; nevertheless, the output from this mine was probably the world's largest for a single producer both in 1916 and 1917. A large mill capable of treating 200 tons of ore a day has been erected.

A great deal of development work has also been done on the molybdenite deposits at Squaw Lake, in Huddersfield township. A considerable proportion of the molybdenum produced in the province was converted into ferro-molybdenum at Orillia and Belleville. Molybdenum is used

largely for hardening steels for automobile construction, while molybdenum wire is used in the manufacture of electric lamps and in scientific instrument trades. The salts of molybdenum form valuable chemical reagents and are also used in colouring pottery. The production of molybdenite has temporarily stopped owing to large stocks on hand at the end of the war.

Copper.—In the Eastern Townships many occurrences of copper sulphide have been discovered. There are two main types of copper ores in these deposits:

(1) Pyrite and chalcopyrite in masses of pure sulphides, in which the iron pyrites predominate, the average percentage of copper in these ores being about 5 per cent.

(2) Chalcopyrite, chalcocite and bornite disseminated in a gangue of quartz. These ores occur in veins rather than masses.

Copper ores are being mined at Weeden and Eustis. The mines are not large but appear likely to be of long duration.

In the neighbourhood of Eastman, about twenty miles from the city of Sherbrooke, are copper mines of great value which were originally worked about seventy years ago, and were operated again successfully during the war by the oil flotation process. As a general rule the copper content runs very high but there are sections where the ore is iron pyrites.

It is an unfortunate condition that there is no smelter capable of handling the ore in Eastern Canada, so the Canadian ore must be shipped into the United States to be smelted. The unlimited amount of hydro-electric power available ought to be a tremendous aid in the treatment of the ore. The production of copper and sulphur ores has been seriously affected by after-war conditions and by the development of the native sulphur industry in the United States.

Zinc and Lead.—In the occurrences of lead and zinc in the province, the ores of the two metals are usually associated. The principal localities are Notre Dame des Anges in Montauban township, county of Portneuf, Calumet island, and the headwaters of Cascapedia river in the interior of Gaspé peninsula. Development work on the deposits in Gaspé peninsula has been actively pushed forward.

Iron Ore.—Iron ore was first smelted in Quebec early in the 18th century and from that time till 1883 the industry was carried on almost continuously at Three Rivers in St. Maurice district. The output was small and the industry derived its chief importance from the superior quality of the pig iron made. The ore used was bog ore and the supply has almost been used up, very small deposits now being found.

A great many iron deposits are found in Pontiac county, but so far they are too limited in extent to be of commercial value. The most important of these is the Bristol mine near Chats falls on the Ottawa river. Development work to date is not sufficient to estimate the reserve of ore, as no diamond drilling has been done.

The magnetic sands on the north shore of the St. Lawrence are estimated to contain 500,000 tons of magnetite, whilst the deposits of titaniferous ore at St. Charles, opposite Chicoutimi, are estimated to contain 5,000,000 tons.

The immense deposits of magnetite, hematite and siderite along Koksoak and Hamilton rivers in northern Quebec may yet prove to be of economic importance, especially those containing a large percentage of manganese which fits them for use in the manufacture of steel by the Bessemer process. The amount of ore in sight must be reckoned in hundreds of millions of tons, and though not everywhere high grade yet the supply of high grade ore is almost unlimited. The ore outcrops observed along upper Hamilton river would seem to indicate that the deposits are widespread and that the ore will be found in almost inexhaustible quantities.

Most of the iron ores of the province are somewhat high in titanium and this has been the stumbling block in their development. Large deposits of these titaniferous ores are to be found along the north shore of the St. Lawrence, below Quebec, and north of Montreal, at Ivry and St. Jerome as well as in the Lake St. John district. It seems probable, however, that there are extensive magnetite deposits along the Gatineau river in Hull township, within a few miles of the city of Ottawa. Several years ago three mines were operated in this district, and 8,000 tons of ore, averaging over 60 per cent metallic iron, were shipped to Cleveland, Ohio. The ore was low in phosphorus and sulphur. Shipments ceased because supplies of ore nearer Cleveland market were discovered.

Chromite.—The chromite industry, centred at Coleraine in Megantic county, is susceptible of great development. The most important chrome deposit in the province is one of recent discovery in the Danville serpentine area near St. Cyr, about six miles from the town of Richmond.

Electro-Chemical Industry.—Quebec has lately attained a prominent place in the electro-chemical industry, which is closely associated with hydro-electric development. It centres very largely around Shawinigan Falls, although there are one or two industries located elsewhere in the province. Some of the companies engaged in this industry at Shawinigan are the Northern Aluminum Company, producing 60,000 pounds of aluminum per day; the Canadian Carbide Company, with a daily capacity of 200 tons of carbide; the Canadian Aloxite Company, covering 15 acres of ground and producing abrasives of all kinds, such as aloxite, carborundum and high-grade ferro-silicon; the Prest-o-lite Company, manufacturing acetylene gas; the Canadian Electrode Company, which manufactures carbon electrodes for the electric furnace work around Shawinigan; and the Canadian Electro Products Company. The last named was organized to supply chemicals to the British War Ministry in the early days of the war, but since peace was declared a part of the building and grounds has been utilized for the manufacture of other chemicals.

Gold and Silver.—The small production of gold and silver in Quebec at present comes from the copper-bearing pyrite ores in the Eastern Townships and the zinc and lead ores of Portneuf county. In the Abitibi district, however, much development has been done since 1917 and several of the properties in the basin of the Harricana river give good promise of success. A small stamp mill has been erected on one of them.

In his preliminary report for 1922 the Superintendent of Mines says: "Great activity in prospecting for gold and staking of claims has prevailed for the last eight or ten months in the northwestern part of the province of Quebec adjoining Ontario. In the townships of Rouyn, Boischatel, Dasserat, Dufresnoy and Dufay, there are at present in the vicinity of 70,000 acres staked out in mining claims. The discoveries are said to be encouraging, and the geological conditions are very favourable to the occurrence of gold deposits."

A New Gold Field.—In his final report for the same year, dated April 30, 1923, the Superintendent further says: "A prospecting rush, following some very promising discoveries in the northwestern part of the province of Quebec, is now in full swing and the staking of claims in the townships of Rouyn, Dasserat, Boischatel, Joannes, Dufresnoy, and surrounding country is at present proceeding with intensity and rapidly. Within the last few months, some 700 claims comprising an area of 100,000 acres, have been staked out. While a number of these may turn out well, and the general geological conditions of the country are favourable to the possibilities of the presence of gold deposits which may eventually turn out into producing mines, there is no doubt that the great majority of the claims staked out, many of them on the snow, will never advance beyond the stage of prospects and assessment work."

"By the preliminary work that has been done," he goes on to say, "several considerable bodies of ore have been revealed. It is a remarkable fact that few assays have been blank. Contents of $7 to $15 a ton are numerous, and many grab samples have given high results. Although the assays are not spectacular, they are notably consistent, and there are indications of large tonnages in several places."

Other Minerals.—Among other minerals to be found in the province are antimony, phosphate, natural gas, nickel, tungsten, manganese, baryte, talc, and arsenic.

Clay Deposits.—While investigation has shown that the high grade clays, such as fire-clays and pottery clays, are limited in the province, there is, on the other hand, a great abundance of raw material suitable for the manufacture of rough clay products throughout the St. Lawrence valley. In contrast with the clays of Ontario, those of Quebec are known as marine clays, deposited under salt water. At one time the entire St. Lawrence valley as far west as the city of Ottawa was submerged beneath the Atlantic, making a great gulf bounded on the north by the Laurentian

mountains and on the south by a height of land corresponding roughly to the present international boundary. During a long period of submergence vast quantities of silt, made by atmospheric weathering process and by the grinding of enormous glacial ice sheets, were transported from long distances by flowing water and deposited in the St. Lawrence valley, in places to a depth of 150 feet or more.

OPEN CUT ON APATITE LEAD, TOWNSHIP OF TEMPLETON
The mineral possibilities of Quebec are only now beginning to be realized.

Brickmaking.—Brickmaking, which is an old industry in the province of Quebec, has recently received further stimulus in renewed building activities since the war. Fortunately, such vast deposits of clay exist throughout the St. Lawrence valley that material for construction will never be lacking. The wooden house, successor to the stone house, is now giving place to brick, and the demand for clay products must continue to increase. Face bricks of the finest quality have been manufactured for the past 10 years at Montmorency and for 25 years at Laprairie. The face brick industry is capable of further development, a large quantity of brick being imported annually, notwithstanding the fact that plenty of material exists within the province for its manufacture.

The greater part of the material used for the manufacture of common brick in the province of Quebec is taken from the soft, stoneless clays of Pleistocene age, which are found abundantly in the St. Lawrence and St. John valleys and in the clay belt of northern Quebec. In some places

these beds of clay are overlain by, or contain, large quantities of stones, boulders and sand, deposited by glacial action, which render the clay unworkable for commercial purposes. In other places large areas of this clay occur practically free from stones or absolutely clean and are then known as "fat" or "strong" clays. One of the largest of these areas lies between the Richelieu river and the St. Lawrence and extends south to the international boundary. Another extensive area is found in the Lake St. John region at the head of the Saguenay river, and still another large area, beyond the height of land, known as the Clay Belt, occurs in northern Quebec, where it is traversed by the Canadian National railway, and extends westward into the province of Ontario for 500 miles. These last-named clays are quite distinct in the method of their origin from the St. Lawrence Pleistocene clays, having evidently been formed from the flow and ebb about the edge of the slowly melting glacier receding towards the north, which produced alternating bands of clay and sand, probably marking each year's additional formation.

The Pleistocene clays of the St. Lawrence valley are remarkably uniform in their composition throughout the entire region and all burn to a red colour. They are chiefly used in the manufacture of cement, brick, field drain-tile, hollow building blocks, fire-proofing brick, and sewer-pipe. As the vitrification point and the softening point are almost identical, they are not suitable for the manufacture of vitrified wares. In some places this difficulty is overcome by mixing with the surface clay a certain percentage of fire-clay imported from the state of New Jersey, which increases the refractory qualities in burning. Excellent sewer-pipe of a reddish vitrified body are manufactured from this mixed clay at St. John.

At Deschaillons, Lotbiniere county, where a number of individual plants are in operation, there exists a large bed of stratified clay having a different origin from any of the low-level clays on the south side of the St. Lawrence. It is of good plasticity, easy to handle, dries quickly in a temperature of 150 degrees Fahrenheit without cracking, and makes the best of common bricks of hard red body with a good ring. An important consideration in the commercial production of brick is the accessibility of the plant to transportation facilities. The plants located at Deschaillons have the added advantage of wharfage and schooner transportation.

At L'Islet station, on the Intercolonial railway, several plants manufacture building brick of high quality from a deposit of varied stratified clay. Were it not for the presence of numerous imbedded pebbles, this clay would be considered one of the best deposits in the province. The plant of La Compagnie de Brique de L'Islet being better equipped with machinery than most of the smaller plants in the province is thereby able to overcome the difficulty of pebbles.

China Clay.—One of the most valuable of all residual clays is that known as kaolin or china clay, white in colour, composed mostly of silica, alumina, and chemically combined water. The only workable deposit of

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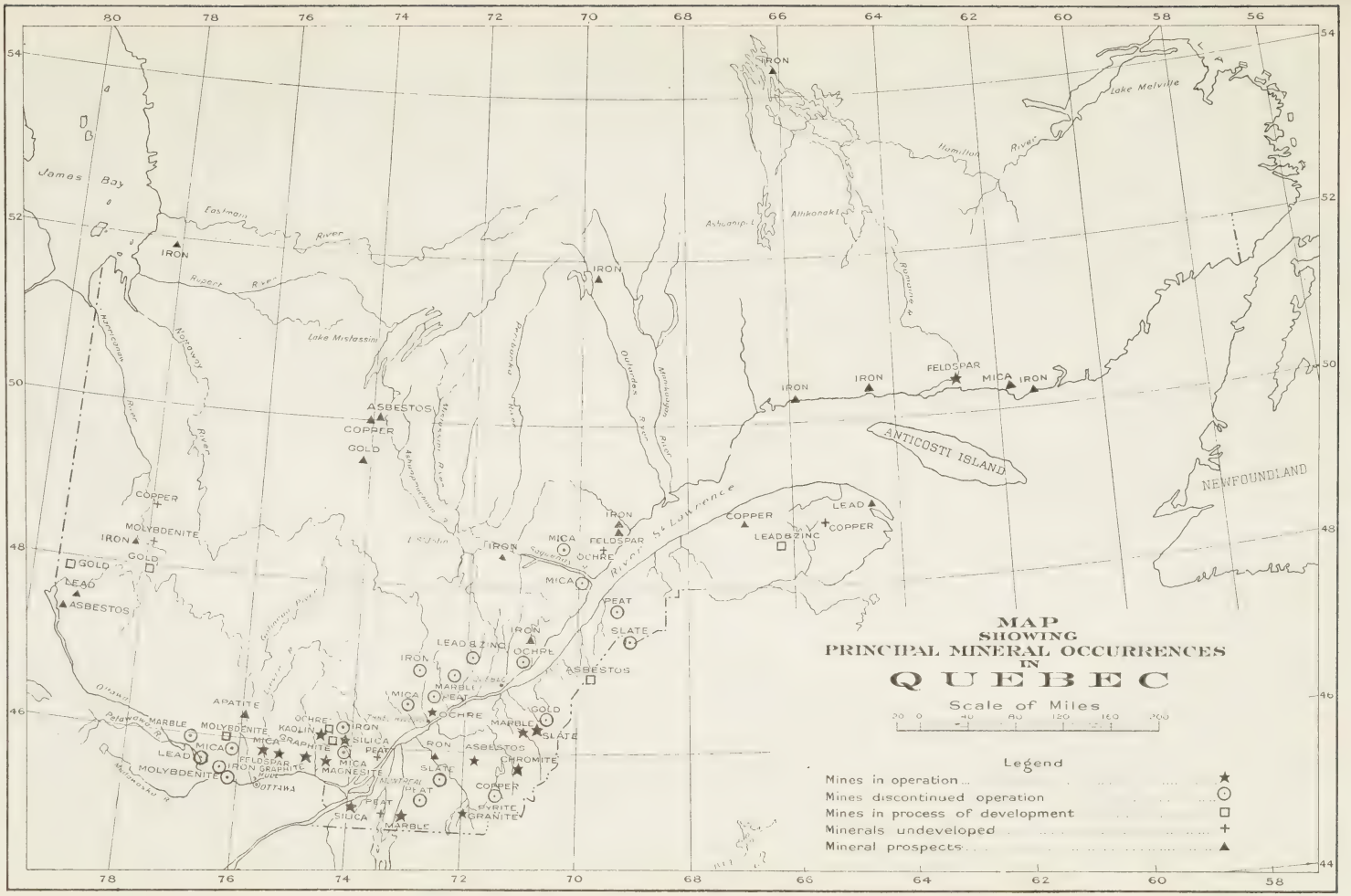


Prepared by the Natural Resources Intelligence Service

kaolin, so far known in Canada, occurs at St. Rémi d'Amherst, about seventy miles northwest of Montreal, where it is found in unexposed veins of varying width. When the raw clay is washed free from impurities, it is known as china clay and is used in the manufacture of white table ware, electrical porcelain, wall tile, as an ingredient in ceramics, and as a paper filler. The Canadian China Clay Company operates this deposit and disposes of the washed kaolin as a paper filler, for which purpose its fineness of grain and pure white colour are very suitable.

The deposit is largely hidden by boulder clay and its extent is not even approximately known, but the size and abundance of the leads so far made bare by trenching and stripping indicate that there are good prospective possibilities for the discovery of large masses of the material. Much of the kaolin uncovered by recent stripping operations has proved to be discoloured and stained by iron oxide. The quantity is almost unlimited, but most of it is unsuitable for the production of white china clay or paper filler. The discoloured material is well suited for the manufacture of refractory materials, such as fire brick, silica brick, furnace lining, glass sand, and steel foundry sand.

Shale.—Among the most valuable clay deposits occurring in large quantities between Montreal and Quebec on both sides of the St. Lawrence are beds of hardened clay called shales. These, when finely pulverized, or subjected to weathering processes, become very plastic and are easily moulded into shape, and burn to a very dense, steel-hard body of rich, dark red colour. Some deposits of shale, such as those found in the vicinity of Lévis, are highly refractory and make excellent vitrified wares, particularly paving brick. At Laprairie is found one of the largest brick companies in Canada using Utica-Lorraine shales.

Other Clay Products.—Investigation has shown that two different shales exist in the province suitable for the making of vitrified paving brick, namely, that of the Sillery formation at St. Charles-de-Bellechase, and that of the Lévis formation at Lévis. These valuable brick have not heretofore been made in the province owing to the scarcity of good vitrifying shales. Fire-proofing is made at Montreal. It is said that the Utica-Lorraine shales which occur in Laprairie and Chambly counties, and the Medina shales in Nicolet county, when mixed with plastic surface clay, are suitable for the manufacture of fire-proofing.

Sewer-pipe is at present made at St. John from imported clay, although it is known that the vitrifying shales at St. Charles-de-Bellechase and at St. Joseph-de-Levis are well adapted for the purpose when mixed with some plastic surface clay.

Refractory wares, such as stove linings, arch brick, furnace fittings, boiler settings and laboratory goods are also manufactured at St. John as well as at Montreal, but the clay used is all imported, no fire-clay having been found in the province. Although some of the ingredients necessary

for the manufacture of sanitary pottery, such as kaolin, quartz, and feldspar, are found in the province, the companies making sanitary pottery import all their raw material from England and the United States.

Accessibility to transportation by both rail and water, abundant supply of raw material and the proximity of necessary fuel, indicate the feasibility of considerable development in the manufacture of clay products within the province. In 1922 the output was 118,399 M bricks, valued at $1,910,355, and tile, drain and sewer pipe, pottery, etc., was valued at $401,492.

Building Materials.—Such building materials as brick, cement, tile, limestone, sandstone, shale, clays, granite, slate and marble in 1922 made up 64 per cent of the value of the mineral production of the province, of which no less than 32 per cent was credited to cement. The cement industry is the growth of the past quarter century, the production rising from 1,000 barrels in 1901 to 2,660,810 barrels in 1922.

Peat.—In the absence of coal throughout the province and the consequent necessity for importing it from Nova Scotia or the United States, at prices which are continually rising, the possession of peat bogs by Quebec is a valuable reserve asset. Careful examination has been made by the Federal Government of twelve peat bogs in Quebec, three of which are traversed by railways and none of which is more than from two to four and one-half miles from a station.

To say nothing of the crude methods by which peat is used as fuel in the British Islands, the scientific preparation of peat for fuel, moss litter, nitrogen recovery, producer gas, alcohol and other chemicals and "filler" for fertilizers, in other countries has been highly developed. It has also been found that certain classes of bogs, when drained and cleared of the valuable surface peat, provide, in time, large areas of excellent land for agriculture. Under present conditions, however, in Canada the economical use of peat would be confined to its use as fuel and litter. As a fuel peat has been manufactured at Farnham, and its production in compressed bales for litter, which, owing to its great power of absorbing liquid and volatile ammonia, becomes a useful fertilizer, might well find a market in Montreal just as peat moss litter imported from Ireland and Scandinavia is largely used in England.

The experiments now carried on at Alfred, just outside the province of Quebec, by the Dominion and Ontario governments have proved that, with proper equipment for excavating, pulping and spreading, the warm summer climate of Quebec reduces the moisture content to a point at which peat fuel can be sold at a price to compete with coal at present prices, even when its lower heating power is taken into consideration. Two tons, or less, of air-dried peat are equivalent to a ton of coal. This being so, a list of the bogs already examined, the estimated amount of the peat available, and an analysis of the fixed carbon and nitrogen content, may well be put down as a statement of a natural resource which, in time, may prove of value.

PEAT BOGS IN QUEBEC

Name	County	Distance from Rail	Tons of Fuel (25% moisture)	Tons of Litter (20% moisture)	Nitrogen content of Dry Peat	Fixed Carbon Content of Dry Peat
		Miles			Per cent	Per cent
Large Tea Field	Huntingdon	2	4,824,000	.....	1·6—2·0	29·2
Small Tea Field	Huntingdon	4½	3,316,000	.....	1·7—2·0	27·7—30·4
Lanoraie	Berthier and Joliette	0	4,751,000	.....	2·0—2·2	26·3—28·2
St. Hyacinthe	St. Hyacinthe and Bagot	2	3,666,000	.....	1·7—1·9	30·5—31·0
Riviere du Loup	Temiscouata	1	12,611,000	1,928,000	0·8—1·1	27·7—29·4
Cacouna	Temiscouata	0	.....	626,000	.....	.....
Le Parc	Temiscouata	0-5	716,000	.....	0·9	27·8
St. Denis	Kamouraska	0	.....	388,000	.....	.....
Riviere Ouelle	Kamouraska	1	2,921,000	2,624,000	1·1	28·9
L'Assomption	L'Assomption	1½	1,760,000	.....	1·5—1·7	26·2—28·9
St. Isidore	La Prairie Chateauguay Napierville	3	2,242,000	.....	1·8—2·2	28·7—31·6
Holton	Chateauguay Napierville Huntingdon	2	2,999,000	.....	2·3—2·5	25·0—27·3
Total available	.....	.....	39,806,000	5,566,000	.....	.....

NOTE.—The Geological Survey, Department of Mines, Ottawa, has just completed the investigation and mapping of the following additional peat bogs in Quebec and early in 1924 will issue a report on them: Farnham, Canrobert, Napierville, Girard, Pont Rouge, Clair, St. Joseph, Isle Verte, St. Arsène, St. Anaclet, St. Luc, Sagamite, Breakeyville, St. Jean, Ste. Thérèse.

Mining Laws.—The Provincial Government disposes of the mining rights on all Crown lands, and on private lands of which the surface rights have been granted by the Government since 1880.

To acquire mining rights on such lands, Crown as well as private, a miner's certificate must be obtained from the Department of Colonization, Mines and Fisheries, at Quebec at a cost of $10. The bearer of this certificate is allowed to stake five claims of 40 acres each, or a maximum of 200 acres. This may be held for six months without payment of any dues. At the end of the six months a mining license must be taken out for which a payment of 50 cents a ~~day~~ year per acre is required. This allows the licensee to make a thorough prospecting of the land before buying outright. There are, however, certain assessment works which must be performed, viz., twenty-five days' labour during the first six months, and twenty-five days a year thereafter on each 40 acres.

Purchase of the mining land can then be made at the rate of $5 per acre for superior minerals, such as gold, silver, copper and iron, and $3 for inferior minerals, such as ochres, feldspar, structural materials and bog iron ores. Within two years from the time of such sale, an expenditure of $500 must be made on each 100 acres, and the title to the land is not issued until this condition is fulfilled.

CHAPTER VI

Water-Powers*

By Dominion Water-Power Branch

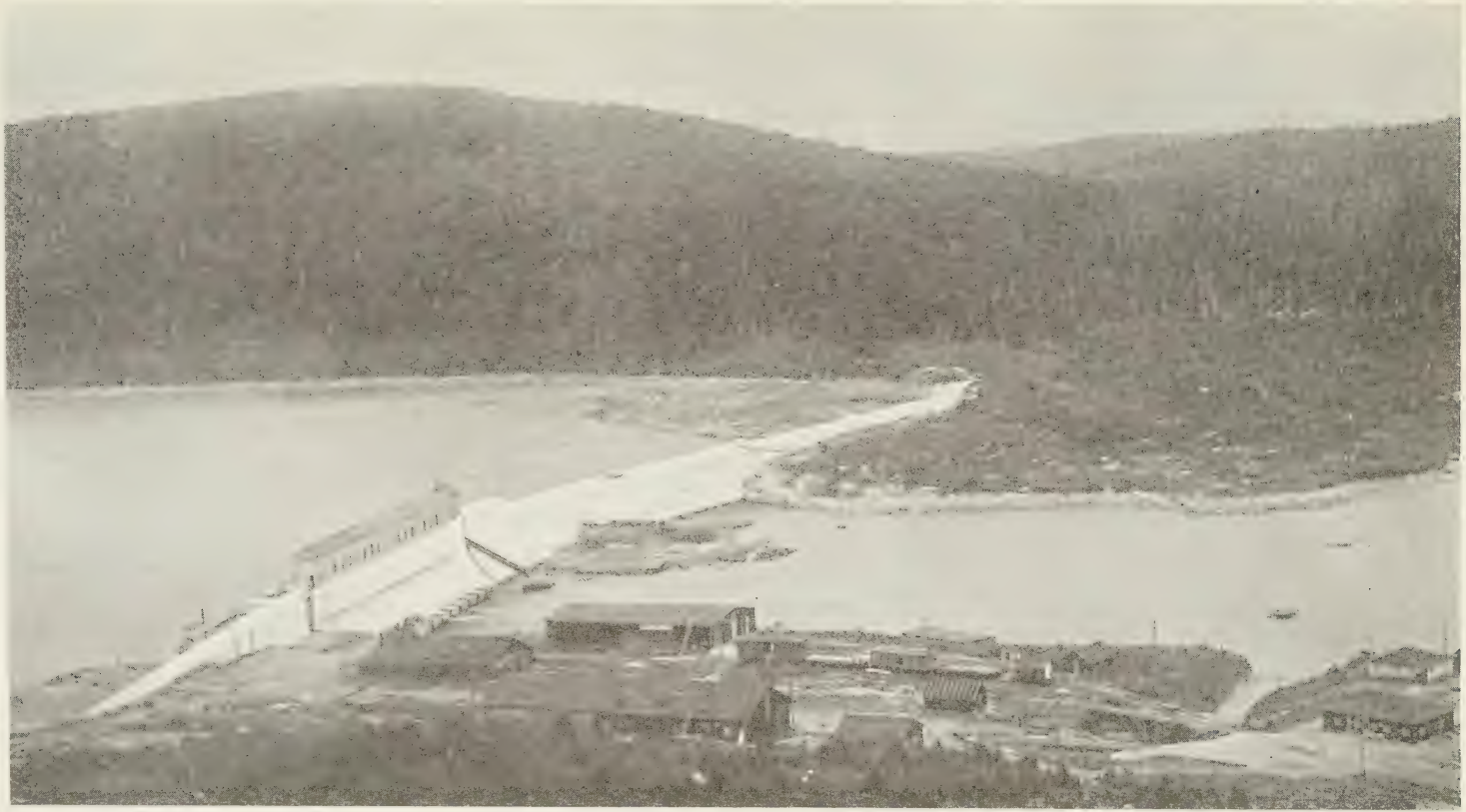
THE water-power resources of Canada have attained a world-wide reputation and no mean share in reaching this high position has been contributed by the province of Quebec. The total power which can be produced at the known sites in the Dominion when the rivers are at their low stage is 18,255,316 horse-power, of which 6,915,244 horse-power is found in Quebec. Over one-third of the 3,227,414 horse-power of developed water-power utilized in Canada is installed in the latter province. Notwithstanding this comparatively large installation, there remains a wide field for further development, particularly in regard to requirements in connection with the development of pulpwood resources and the electro-chemical industry. The replacement of fuels at present used in various industries also affords a further opening.

Leasing of Water-Powers.—Since 1897, the Quebec government, has carried on water-power investigations. Legislation is provided for the proper disposal of water-power to competent organizations wishing to undertake development. The streams and lakes of the province are administered by the Hydraulic Service of the Quebec Department of Lands and Forests and the leasing of water powers is usually governed by the following general principles:

1. Term, not over 99 years; usual term is 75 years.
2. Payment of an unvarying yearly rental during the term of lease.
3. An additional yearly charge of fifty cents per horse-power developed.
4. Charge mentioned in (3) above is subject to revision every 10 years.
5. A delay of two years is granted for beginning works and of two further years for producing power.
6. The lessee is under obligation to make a deposit in money or in securities as a guarantee of good faith in the carrying out of the contract.
7. The grantee must submit plans of his works, mills, etc., to the department previous to their installation.

Appendix V, page 128, contains a list of the larger powers in Quebec.

*Water-power resources of Quebec are administered by Provincial Department of Lands and Forests, to whom application should be made for water-power privileges. Extensive investigations have been made by the Quebec Streams Commission in co-operation with the Dominion Water-Power Branch of the Interior Department, Ottawa. Detailed information concerning power sites or power rivers can be had from Chief Engineer, Quebec Streams Commission, 59 Notre Dame St., E., Montreal, or Director of Water-Power, Ottawa.



THE GOUIN DAM AT LA LOUTRE, QUEBEC

The dam, completed in 1917, to increase the power facilities of the St. Maurice river, forms the largest storage reservoir for power purposes in the world. It has a capacity of 160 billion cubic feet of water.

Storage Reservoirs.—The Quebec Streams Commission in addition to basic investigations which it carries out in co-operation with the Dominion Water Power Branch of the Department of the Interior, also plays an important part in increasing the value of the water-powers of the province through its work in the construction and operation of storage reservoirs.

The most important reservoir operated by the commission is on the St. Maurice river where the Gouin dam controls a storage capacity of 160,000,000,000 cubic feet of water and more than doubles the power possibilities of the power sites on the river. It is the largest storage reservoir in the world, built for power purposes. The Allard dam on the St. Francois river stores 12,000,000,000 cubic feet and the regulation of the river adds some 40,000 horse-power to its power possibilities. Two reservoirs on the Ste. Anne de Beaupré river have recently been completed and considerably increase its dependable flow. The Commission has now under construction a 13,000,000,000 cubic feet reservoir on lake Kenogami, near Chicoutimi, and one of 2,198,000,000 cu. ft. on the Metis river; and is studying several other sites with a view to future undertakings of this kind.

Shawinigan Falls Power.—The St. Maurice river, one of the largest tributaries of the St. Lawrence, affords power at Shawinigan Falls for the largest concentration of industrial developments in the province. The extensive installation found here is, to a great extent, a result of the work on the regulation of the flow of the river by the Quebec Streams Commission. The various plants at this site have a total capacity of some 260,000 horse-power under a head of 148 feet. The greater portion of this is for hydro-electric production, while a large pulp mill also operates from this fall. The St. Maurice also supplies power to another of the largest hydro-electric plants in the province a short distance from Shawinigan, at Grand Mère, where an installation of 176,000 horse-power operates under a head of 76 feet. A portion of La Tuque power on the same river is also used, while a 120,000 horse-power hydro-electric plant under a head of 65 feet is under construction at Gabelle, a short distance below Shawinigan Falls.

A portion of the St. Maurice power is used locally for the pulp and paper and electro-chemical industries, and large amounts are transmitted to Montreal, Quebec and to the Eastern Townships, where it is extensively used in asbestos mining. Other sites on the St. Maurice and its tributaries await development under heads of from 50 feet to 200 feet. Other direct tributaries of the St. Lawrence in the vicinity, such as the Assomption, Ouareau, Maskinonge and Batiscan rivers, also contain numerous possibilities.

Montreal District.—The Montreal district is generously supplied with hydro-electric power from a number of plants in the vicinity, including the large Cedars plant on the St. Lawrence river. A certain amount is also received from Shawinigan Falls. Augmentation of the present supply is to be had from the further utilization of the rapids of the St. Lawrence

POWER SUPERABUNDANT

A view of Chelsea Falls on the Gatineau river a few miles north of the city of Ottawa.

between the city and lake St. Francois, the total available being approximately 2,000,000 horse-power. Some of the Ottawa River powers are also within economic transmission distance.

Ottawa River Powers.—With the regulated flow from three large storage reservoirs now in operation, the water-power possibilities of the Ottawa river have been estimated at 1,000,000 horse-power. The larger portion of this power is equally divided between the provinces of Quebec and Ontario. The Chaudiere falls, between Ottawa and Hull, is being fully utilized, while two or three other sites on the river are partially developed. The tributaries of the Ottawa river from the Quebec side abound in power possibilities, and comparatively few of them have been utilized. The most important of these, the Gatineau, has numerous possible sites aggregating over 170,000 horse-power.

Eastern Townships.—The Eastern Townships, with Sherbrooke as a centre, receives power transmitted from Shawinigan Falls, but also obtains a large share from various sites on the St. Francois and adjacent rivers and tributaries. The storage regulation of the St. Francois by the Quebec Streams Commission has greatly increased its power possibilities and numerous sites on it are utilized for hydro-electric and pulp and paper purposes. A new 33,600 horse-power plant under a head of 50 feet will soon be added to the present facilities. The Becancour and Chaudiere rivers, which may be considered in this district, are also important from a water-power viewpoint.

Other South Shore Powers.—Further down the south shore of the St. Lawrence, the Sud river is partially utilized, while du Loup river, falling into the St. Lawrence over a series of cascades, contains many water-powers of which over 4,000 horse-power is utilized. The Rimouski river has a number of utilized and latent sites near its mouth, and in the same district a 3,500 horse-power hydro-electric plant under a head of 120 feet is being completed on the Metis river, while the Madeleine, one of the most important rivers of Gaspé county, offers many power possibilities, 5,600 horse-power having been already developed at two adjacent sites by a pulp and paper enterprise.

Quebec City and District.—Quebec city and district is also generously supplied with hydro-electric energy from a number of plants in the vicinity, while power is also received from the St. Maurice river. Several tributaries of the St. Lawrence, both above and below the city, such as the Ste. Anne de la Perade, Portneuf, Jacques-Cartier, Montmorency, Ste. Anne de Beaupré and Malbaie rivers, have many utilized and undeveloped power sites.

Lake St. John District.—The Chicoutimi or Lake St. John district abounds in water-power possibilities and some of the most important pulp and paper mills of the province have been attracted here by this valuable source of energy. Power is being utilized on the Chicoutimi,

WATER POWER IS ONE OF QUEBEC'S MOST VALUABLE RESOURCES

Sable, Shipshaw, Ha! Ha!, and other rivers in installations aggregating over 100,000 horse-power. The power on the first two rivers will be greatly increased by the thirteen billion cubic foot reservoir at Kenogami now under construction by the Quebec Streams Commission. One of the largest hydro-electric developments of the province, of 420,000 horse-power ultimate capacity, is under construction by the Quebec Development Company at the Grand Discharge of lake St. John in this district. Other rivers of this region known to offer power possibilities include the Chamouchouane, Peribonka, Mistassini and Matabetchouane.

The north shore of the St. Lawrence, below the Saguenay, also contains large rivers offering attractive water-power sites. Some of these are being utilized to a limited extent by the pulp, paper and lumbering industries. The most important rivers known to possess latent power include the Outardes, Bersimis, Manicouagan, Romaine, St. Augustin and Natashkwan.

Farther north, the Hamilton river has two possible sites aggregating over 400,000 horse-power. The large rivers flowing into James bay are also reported to have many power sites, such as those on the Eastmain, Rupert, Nottaway, Harricana, Bell and Megiscane.

Electro-Chemical Industries.—Great quantities of cheap power are known to attract various branches of the electro-chemical industry and thus important electro-chemical centres such as now exist at Shawinigan Falls may be expected to develop at other large power sites of the province. Some of the products requiring cheap power and which, therefore, can be best and most economically manufactured by hydro-electric energy are the following: aluminium, magnesium, carbon electrodes, ferro-alloys, carborundum, caustic soda, chlorine, cyanamide, silicon, calcium carbide, graphite and electrolytic zinc. Most of these are at present being manufactured at the large Canadian electro-chemical centres at Niagara and Shawinigan Falls.

Generation of Steam by Electricity.—In view of the recent advances made in the production of steam in electrically-heated boilers for industrial purposes, Quebec's water-powers may help to replace many thousand tons of coal used for this purpose. Industries such as pulp and paper, dyeing, brewing and tanning, require large amounts of steam for heating purposes. Excluding railways, there is still 30 per cent of the power produced in the Dominion derived from fuel and 70 per cent from water-power, while, if railways are included, the proportion becomes 55 per cent from fuel and 45 per cent from water-power. The proportion of power in Quebec province produced from water no doubt reaches a greater percentage, but there is, nevertheless, possibilities of replacing fuel, as shown by numerous recent installations of electrically-heated steam boilers in the pulp and paper industry.

CHAPTER VII

Fisheries and Game

"FISH of all the kinds ever heard of abound in the river; for, from its mouth up to its end in proper season will be found nearly all kinds of salt and fresh water fish; also will be found in Canada large numbers of whales, porpoises, sea-horses, and adhothuys,* a kind of fish we had never seen or heard of. They are as large as a porpoise, white as snow, have a body and head like a greyhound, and stay in brackish water between the river of Saguenay and Canada. There will also be found in June, July and August plenty of mackerel, mullet, barr (sartres), large eels and other fish, also smelt, as good as in the River Seine, and plenty of lampreys and salmon. Above Quebec are bass, trout, carp, bream and other fresh water fish. And all fish are taken in large numbers in their season by the tribes for food."

Thus in his quaint fashion did Jacques Cartier, the French explorer, on his second trip to Canada in 1535, describe the fisheries of the province of Quebec. His reference, of course, is only to the sea and river fisheries of the St. Lawrence; for he did not have opportunity to penetrate into the interior of the province, which has become famous over the continent for its abundance of ounaniche, salmon, trout, bass and other game fish.

An Early Industry.—More than four centuries ago Basque and Breton fishermen visited the gulf of St. Lawrence and fished the waters that still give employment to the fishermen of Gaspe and Labrador. After Cartier's explorations the sea fisheries of New France rapidly attained importance and were the source of an extensive commerce. The fishing industry became the nursery of explorers, discoverers and accomplished sailors for the navy.

After the British occupation of Canada, capitalists from the Channel islands became interested in the Canadian cod fisheries. The Jersey firms that settled in Chaleur bay as early as 1764 eventually succeeded in controlling the fishing industry in much the same way as the Hudson's Bay Company did the fur trade, and even to this day they have under their control twenty-five to thirty fishing stations, but the fishermen are becoming more and more independent of them.

*Now known as the porpoise or white whale.

Commercial Importance.—The fisheries of the province may be classified into commercial and game fisheries. The commercial fisheries are confined largely to the gulf and river St. Lawrence, while the game fish are found in the streams and inland lakes. Quebec ranks fifth among the provinces of Canada in value of fish caught. The value of commercial fish taken under war-time prices reached its maximum at $4,568,773 in 1918. By 1921 this had declined to $1,815,284, and in 1922 it was $2,089,414. The value of the fish caught in the rivers and lakes of the province was $171,660 in 1920-21, and $198,459 in 1922. The game fisheries, through

QUANTITY AND VALUE OF COMMERCIAL FISH CAUGHT AND MARKETED IN QUEBEC, 1913, 1919, 1921 AND 1922

	1913	1919	1921	1922
Cod.....cwt.	365,052	759,982	441,022	416,732
$	716,271	2,629,260	801,191	839,435
Lobsters.....cwt.	41,310	31,845	30,311	33,082
$	314,015	405,237	338,167	470,667
Mackerel.....cwt.	23,598	32,790	24,982	53,770
$	126,206	259,193	140,053	213,964
Herring.....cwt.	364,545	337,139	186,767	188,946
$	197,351	345,534	160,686	149,009
Salmon.....cwt.	12,761	5,807	7,805	12,206
$	161,553	62,921	77,122	122,001
Eels.....cwt.	2,781	7,842	7,024	10,020
$	18,336	93,318	58,629	60,118
Smelts.....cwt.	.....	2,104	2,958	3,613
$	.....	24,969	33,089	27,363

permits and the rental of fishing privileges, produce a certain amount of revenue annually but the greatest benefit these fisheries bring is not easily estimated in dollars and cents. Those who come into the province to enjoy the sport of fishing are usually men of means who spend liberally on railway fares, hotel bills, supplies, guides and other purposes. Very often, too, they are attracted by the rich undeveloped resources, and many cases could be cited of the building of factories and the inception of other industrial projects as a result of the fishing or hunting trips of wealthy men.

SALT-WATER FISHERIES

The coast line of Quebec from Chaleur bay to the straits of Belle Isle measures over 2,000 miles, and along this stretch are to be found innumerable harbours and coves in many of which valuable fish are taken in considerable quantities with little effort. The principal kinds caught in the

salt water of the gulf and of Chaleur bay are cod, herring, mackerel, lobster, salmon and smelts. In addition, whales are harpooned in the gulf and along the north shore of the St. Lawrence as far as Clarke City.

Deep Sea and Coastal Fisheries.—The fisheries of the Atlantic coast may be divided into deep-sea and inshore or coastal fisheries. The deep-sea fisheries are pursued in vessels of from 40 to 100 tons, carrying crews of 12 to 20 men, and the fishing grounds lie at a distance of 20 to 90 miles off shore. The inshore or coastal fisheries are carried on in small boats with crews of two to seven men. The inshore area extends generally from Quebec to the mouth of the Saguenay, while beyond is known as the deep-sea area. The Provincial Government has the vested rights in its tidal waters, that is to say, in both these areas, with the exception of the waters surrounding the Magdalen islands in the gulf. The remaining portion, classed as fresh-water areas, and comprising all the inland lakes and rivers, is also controlled by the Provincial Government.

Cod the Most Valuable.—The most valuable salt-water fish caught is the cod. Heralded by schools of herring and capelin, schools of cod appear in the gulf and Chaleur bay in May and sometimes towards the end of April. The fishermen usually fish for these in small open boats along the shore, but occasionally venture out to a distance of twenty or thirty miles.

Cod cured on the Gaspé coasts is of the finest quality and shipments are made regularly to Spain, Italy and Brazil. The importation of this dried cod into some of the southern republics of South America has been stimulated there by the scarcity of meat.

The quantities of cod in the southern waters of the gulf of St. Lawrence off the shore of the Magdalen islands and the mainland of Gaspé and Bonaventure appear to show very little diminution year by year, but the coastal cod fisheries on the north shore of the St. Lawrence have declined in recent years, as the cod have been seeking deeper water. This is doubtless due to the rapid disappearance of the whales from the St. Lawrence as a result of the past activities of the Seven Islands whale fishery; the capelin, upon which the cod largely feed, are not driven inshore to the same extent as formerly, with the result that the cod search for their food in the deeper waters of the gulf where they are taken in larger quantities by trawlers, chiefly from the Maritime Provinces. Many good food fish, as well as cod, are undoubtedly destroyed by the numerous white porpoises of the lower St. Lawrence and gulf and by the voracious dogfish, which is also very destructive to the fisherman's bait.

Herring Are Plentiful.—Spring herring have been moderately plentiful during the last few years. They enter the gulf with the spring tides about the beginning of May and are first found at the Magdalen islands. After a few days they appear at the head of Chaleur bay, then along the Gaspé coast and later at Anticosti island. The final catch of this spawning herring is made early in June above cape Whittle on the north

coast at a place called "The Bluff." During the rest of the season catches of herring inshore are more or less uncertain, though fishing for them is carried on along the Gaspé coast west of cape Rosier.

Both herring and mackerel fishing industries offer excellent opportunities for much greater development. They are much neglected at present, especially the mackerel fishing.

Salmon in the Gulf.—The commercial salmon areas of Quebec are the estuaries of the rivers of the Gaspé peninsula and of those flowing into the north shore of the river and gulf of St. Lawrence from the Saguenay to the straits of Belle Isle. Salmon fisheries have been operating for some time at the estuaries of the Bersimis, Moisie, and Natashkwan rivers which are renowned for the large quantity and size of their fish. There is practically no salmon fishing west of the Saguenay. Formerly every important tributary of the St. Lawrence as far west as lake Ontario was a salmon river. Poachers and the pollution of the rivers from the numerous saw and pulp-mills are mainly responsible for the changed condition of the fishing in the rivers. Some of these could possibly be restocked with advantage provided the contamination of the water ceased.

Lobster Fishery.—The lobster fishery in the waters of the Gulf is an important one and it supports no less than fifty-one canneries. Increased canning operations threatened the fishery for some time, but the efficient enforcement of the fishery regulations is having the desired effect in increasing both the salmon and lobsters in the Gulf. The operation of lobster hatcheries is also doing its part in augmenting the supply. In the vicinity of the Magdalen islands lobsters are reappearing at certain places where they have not been seen for years.

Opportunities for Development.—The gulf of St. Lawrence is still in its infancy as regards the development of its fisheries. There are vast stretches of coast and numerous "banks" which have never been fished, except by the antiquated hook-and-line methods. Yet these waters are one of the world's chief congregating places for the cod, while many other varieties, including halibut and the unrivalled Atlantic salmon, are also more or less numerous in certain localities, and sea trout swarm in the brackish waters of the rivers where they meet the tide water.

Strange to say, most of the fish consumed in the province has been coming from the United States. Advertisements of fresh cod shipped direct from Portland, Maine, frequently appear in the Montreal papers. More remarkable still, fish from the Pacific coast is advertised and sold as far east as Toronto, Ottawa and Montreal, 3,000 miles or more from the waters where they are caught, while the salmon and cod and other fine varieties of fish at the very doors of the province have been exported in a salted or dried condition to Europe, the West Indies and the United States. It would appear, therefore, that opportunity exists for enterprising fishermen to build up a considerable home market for their catch.

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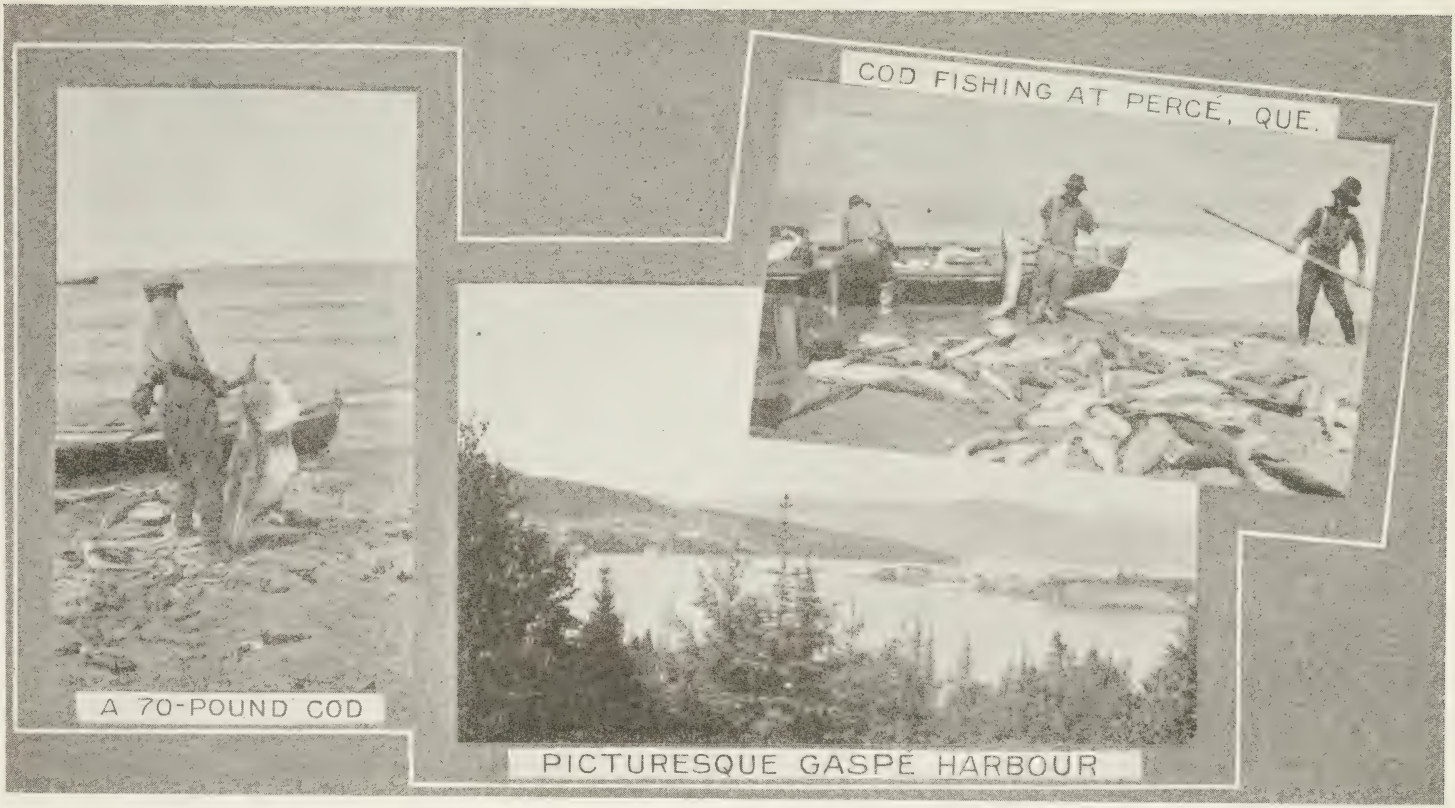

SCÈNES ON THE GASPE COAST

A thriving fishing industry exists on the coast of the Gulf of St. Lawrence in Quebec.

With a view to encouraging the development of the sea fisheries and the building of fishing vessels the Dominion Government pays $160,000 annually to fishermen of the eastern Maritime Provinces. The bounty is distributed under regulations made from time to time by the Governor in Council, and the fishermen of the province of Quebec share in it.

INLAND FISHERIES

For many years no attempt was made to use the fish resources of the many lakes in the northerly areas of the province. It is only comparatively recently that commercial fishing has been established in the Abitibi district at lakes Abitibi, La Motte, Askiwaj, Lois, Duparquet (Agotawegami) and Dasserat (Mattawa Gosik). Lakes Kipawa and Timiskaming and the portion of the Bell river comprising lake Shabogama and Escalana river and lake are also now being fished for commercial purposes. A quantity of excellent fish has been the result and many shipments have been made to Montreal and the other Canadian centres and some to the United States. Eel fisheries have been established on the Richelieu river, on the St. Lawrence both above and below Quebec and at Orleans island.

Kinds of Fish.—The principal varieties of inland fish marketed are eels, whitefish, pike, sturgeon, trout, carp, fresh herring, bass, maskinonge, salmon and pickerel. Touladi (grey or fork-tailed trout) are found in many rivers and lakes, especially in the Temiscouata region, while lake St. John and its outlets teem with ouananiche or land-locked salmon.

Difficulty of transportation has up to the present prevented development of the extensive inland fisheries of northern Quebec. In the Rupert river the sea-trout and whitefish are in such abundance that the Indians and the Hudson's Bay Company's crews gather there from miles around to scoop out, by means of landing and bag nets, their winter supply of fish. Speckled trout, dore (pickerel), maskinonge, and salmon trout from five to fifty pounds in weight are found in lake Mistassini. The common pike and the whitefish are plentiful throughout the waters of the northern regions. Sturgeon are procurable in the Nottaway river system and in the river Obatogamau and its tributaries. In lake Chibougamau there are trout from four to six pounds in weight, whitefish from four to eight, pike and pickerel from eight to ten, and lake trout of very large size and excellent quality.

Game Fish Abound.—In the maze of streams and lakes forming the headquarters of the Ottawa, Gatineau, and St. Maurice rivers, the distinguishing feature is that trout, which are rare in the Bell river area and are almost entirely absent from the headwaters of the Ottawa in northern Pontiac, are found in the upper reaches of the St. Maurice and the Gatineau. Bass, pike, pickerel, whitefish, and the coarser kinds of fish are obtainable everywhere, while in the larger rivers and lakes, such as Kakabonga and Grand Lake Victoria, sturgeon also abound. The country drained by the Gatineau is thickly dotted with beautiful lakes rich in trout and bass.

PROUD OF HIS CATCH

—And who wouldn't be, with such a trout as this, caught in the Gatineau district. Fishermen from all over the continent flock to Quebec in the fishing season.

HUNTING AND ANGLING

Privileges Leased.—Quebec is the only province in the Dominion which leases the exclusive fishing and shooting rights over large tracts of forest, lake, or river territory. These privileges are leased to residents and non-residents alike. A very important provision of the leases is that which requires the lessees to guard from poaching the fish and game in the lands leased to them.

Residents of the United States have been quick to see the advantages this province offers them and many of the best fishing lakes and hunting grounds are in their possession. Some United States fish and game clubs spend from $10,000 to $50,000 a year within the province, and the prices paid for salmon-fishing rights on some of the rivers flowing into the St. Lawrence ranges from $5,000 to $12,500 annually.

Salmon Rivers.—In the Gaspé peninsula are found some of the finest salmon rivers in the country—the Restigouche, Matapedia, Cascapedia, Bonaventure, York, St. John, Dartmouth and the Magdalen. The angling rights in the Cascapedia, which is one of the finest salmon rivers in the world, bring in $12,000 annually. The Matapedia is renowned for its magnificient scenery, picturesque rapids and the enchanting pools where lurk salmon of astounding size. The angling in the salmon rivers flowing into the Saguenay and in the most accessible of those emptying into the St. Lawrence river and gulf from the Sagueany to the eastern limits of the province is leased to private individuals and clubs, and is carefully preserved.

Sport with the Ouananiche.—A three hours' trip from Chicoutimi, the upper terminus of navigation on the Saguenay, brings the angler to lake St. John—the heart of the best ouananiche (land-locked salmon) fishing in the world. In the turbulent waters of the Grand Discharge of this great inland sea the most exciting form of sport can be enjoyed, but in almost every part of the lake good fishing is to be had during the first two months of the season. Practically unlimited are the well-stocked trout waters that reach out from the lake in all directions. The majority of the best rivers and lakes of the St. John district are already under lease by fish and game clubs.

In Temiscouata county magnificient fishing is said to be had in the large lake of that name and in the Touladi river, and the Squatteck lakes. It is in these waters that the grey or fork-tailed trout, which range in size from 2 to 6 pounds, are obtainable.

Lakes That Have Never Been Fished.—In the counties of Ottawa and Pontiac there are hundreds of lakes teeming with bass or trout that have never yet been fished. In fact, throughout the province there is an abundance of streams and lakes rich in the most magnificent brook and lake trout.

A SUCCESSFUL HUNT, GATINEAU DISTRICT
BEACH AT CAP A L'AIGLE
DIVIDING THE SPOILS
FISH FOR DINNER
SALMON FISHING, KING OF SPORTS

QUEBEC IS THE SPORTSMAN'S PARADISE

The control of fishing leases is in the hands of the Fish and Game branch of the Provincial Department of Colonization, Mines and Fisheries, at Quebec. Although many of the most noted streams are under lease there are numerous opportunities available for the very best salmon and trout angling. Excellent fishing waters are still unleased in the Saguenay region, in the counties of Chicoutimi, Lake St. John, Charlevoix, Ottawa, and Pontiac and in the more northerly portions of the counties of Champlain, St. Maurice, Maskinonge, Berthier, and Joliette.

LEASES OF HUNTING AND FISHING RIGHTS, FOR THE YEAR 1920-1921

Number of clubs and private lessees	495	No. of camps belonging to clubs	1,177
Rents paid for hunting	$37,721.05	No. of camps belonging to private parties	580
Rents paid for fishing	$90,610.50	No. of boats belonging to clubs	2,625
Rivers under lease	158	No. of boats belonging to private parties	1,528
Lakes under lease	2,202	No. of guardians	480
Square miles of hunting territory under lease	8,930	No. of guides	1,237
Miles of road and portage road	2,577	No. of club resident members	2,841
Improvements and buildings, value	$2,029,223.41	No. of club non-resident members	2,672
		No. of guests	3,324

FISH TAKEN IN THE YEAR 1920-21

Trout	126,476 lbs.
Salmon	37,212 "
Other kinds of fish	19,963 "

Fishing Regulations.—The open season for angling is as follows:

Salmon—May 1 to July 31; fly fishing—May 1 to August 15.

Salmon Trout—December 2 to October 14.

Bass—June 16 to March 31. No black bass under 9 inches and no rock bass less than 6 inches in length are to be retained.

Maskinonge—June 16 to April 14. No fish to be retained less than 24 inches in length.

Ouananiche—December 1 to September 30.

Speckled Trout—May 1 to September 30.

Grey Trout (lunge), touladi (lake trout)—December 2 to October 14.

Dore—May 16 to April 14 (15 inches is minimum length).

Whitefish—December 2 to November 9.

License Fees.—The fee for fishing for salmon for non-residents is $25 for the season. For fishing for any other kinds of fish for non-residents, $10 for the season. For non-resident active members of incorporated clubs which are lessees of fishing territory, $5 for the season.

The Minister of Colonization, Mines and Fisheries at Quebec, may grant fishing leases for not more than nine years. Leases or licenses for a longer period, but not exceeding fifteen years, shall be granted only by the Lieutenant-Governor in Council.

Full information relating to hunting and angling may be had from the Fish and Game Branch, Department of Colonization, Mines and Fisheries, Quebec, Quebec.

Hunting.—Although the province of Quebec was the earliest settled portion of Canada, it is one of the best big game territories on the North American continent. There are hundreds of square miles of forested lands where the moose, deer, and bear roam as did their ancestors a hundred years ago. In the fiscal year 1920-21 there were 174 moose, 489 deer and 2 caribou killed in the province.

Big Game Country.—Good hunting is to be had in Chicoutimi and Charlevoix counties and in the northern parts of the counties of Montmorency and Quebec. The Laurentides National Park,* which covers an area of about 3,700 square miles within the counties of Montmorency, Charlevoix and Quebec, is one of the largest fish and game preserves in the world. It shelters an abundance of large and small game and encloses the headwaters of such magnificient trout streams as the rivers Montmorency, Jacques-Cartier, Ste. Anne, Batiscan, Metabetchouan, Chicoutimi, and others. A more liberal policy in the opening up of this park to the tourist and sportsman is now in force and permits for hunting and fishing are issued by the Provincial Fish and Game Branch.

CARIBOU CROSSING A LAKE IN QUEBEC
Sights such as these make the hunter long for the woods.

Moose.—Moose are very plentiful in the forests along the St. Maurice river, and in the Ottawa district, with its enormous back country, including the Mattawa, Kipawa, and Timiskaming regions, moose, woodland caribou, and deer are all to be found. Excellent wild fowl shooting is to be

*An attractive descriptive booklet entitled *The Laurentides National Park, Quebec*, which gives the approximate costs of trips to this park, is issued for free distribution by the Department of Colonization, Mines and Fisheries, Quebec.

obtained, as duck, partridge, plover, snipe, and woodcock are all very plentiful. The excellence of the fall shooting of wild geese, partridge, and duck deserves special mention. Moose are also very numerous in the counties of Temiscouata, Montmagny, and Rimouski; immense numbers of them roam practically undisturbed over thousands of square miles of virgin forest in the heart of the Gaspé peninsula, the greater portion of which is a fish and game reserve, sheltering, among other animals, numbers of deer, caribou, and bear. Thousands of caribou enjoy a fairly secure retreat in the forests skirting the Patapedia river in Rimouski and the headwaters of the Matapedia in the interior of Matane county.

Hunting Regulations.—The open season for hunting big game is as follows:

Moose.—In counties north of the St. Lawrence river, September 10 to January 1, inclusive.

In counties south of the St. Lawrence river, September 20 to January 1, inclusive.

Deer.—September 1 to December 1, inclusive.

Caribou.—September 20 to January 1, inclusive.

The young of deer, moose or caribou, if only one year old or less, must not be hunted or killed. Cow moose must not be killed at any time.

Not more than one moose, two deer, and two caribou may be killed in one season by any one person.

The Minister of Colonization, Mines and Fisheries may lease by auction or by private arrangement, hunting territories not exceeding 200 square miles each to one or more persons for not more than ten years, for an annual sum of not less than $3 per square mile.

Game Birds.—Woodcock, snipe, plover—September 1 to December 15, inclusive, except in districts adjacent to tidal waters, where the season is September 1 to November 30.

Widgeon, teal, or wild duck of any kind (except eider duck, wood duck, wild swan, sea parrot, gannet, guillemot, and sea pigeon), September 1 to December 15, inclusive.

Birch or Spruce Partridge—September 1 to December 15, inclusive.

A non-resident's license fee for general hunting in any part of the province costs $25 for the season, but for non-residents who are active members of duly incorporated fish and game clubs of the province, the license costs $10 for the season.

THE FUR INDUSTRY

A widely distributed natural product of an exceedingly large area of Canada to-day is fur, and the province of Quebec contributes in no insignificant manner to the prosperity of Canada's fur trade. It possesses in its northern and its unexplored regions a territory supporting an abundance of fur-bearing animals.

Trading Permits.—Legislation enacted by the Provincial Government recently has helped to place the fur industry on a very sound basis and has resulted in greatly diminishing the number of furs illegally taken. Fur traders are now obliged to take out a permit and to make monthly reports of all furs or skins bought by them. The cost of a permit is fixed by Order in Council but the maximum amount which can be charged is fixed by the legislature at $25 annually for residents and $100 for non-residents.

Royalties Charged.—Each person in possession of skins or furs of animals hunted or killed within the province has to pay a royalty on each skin according to the following schedule: badger, 25c.; bear, 60c; bear (white), 70c; beaver, $1; caribou, 10c; deer, (red), 10c; ermine, 5c; fisher (white), $1.50; fox (bastard), 50c; fox (black), $15; fox (blue), $1.75; fox, (cross), $1.55; fox (red), $1; fox (silver), $10; fox (white), $1.75; lynx, 50c; marten, 75c; mink, 25c; moose, 25c; muskrat, 5c; otter, $1; rabbit (per 100), 5c; raccoon, 15c; seal, 25c; skunk, 20c; squirrel (per 100), 25c; weasel, 2c; wolf, 70c; wolverine, 40c.

On every other fur-pelt or skin not mentioned above a royalty equivalent to 5 per cent of its commercial value is collected. Upon receipt of the royalty a mark is affixed to each skin. In this way no skin can be shipped outside of the province without being stamped and the royalty paid thereon under a penalty of a fine and confiscation. These regulations also apply to shipments of furs or skins from one portion of the province to another, provided there are provincial officers at these localities to mark them. The purchase and shipment of furs taken out of season are prevented by making it compulsory to have the contents of all shipments of either game or skins of any kind whatsoever plainly marked on the outside.

Trappers or hunters who do not do trading themselves, in the proper sense of the word, are exempt from all taxes, provided they are British subjects resident in the province and dispose of their furs within the province.

The license for tanning, dyeing and glossing fur is $1 annually and the holder of every such license must make a yearly return of the number and species of the animals he has treated together with the names and addresses of all persons who have entrusted him with such animals.

During the fiscal year ending June 30, 1922, the revenue derived from the fur trade licenses issued by the Department of Colonization, Mines and Fisheries amounted to $22,420 and the imposition of the royalty in furs realized $126,519. From April 1, 1921, to March 31, 1922, skins of different sorts were produced representing a value of $3,327,000.

Fur Farming.—The rapid rise that has been witnessed in the price of fur during recent years led to the artificial breeding of the fur-bearing animals, an industry requiring a suitable climate and latitude, and this is

to be found to perfection in some parts of Canada.* The placing of fur-farming on a commercial basis was originated in Prince Edward Island by Robert Oulton in 1887. By 1914 the breeding of fur-bearing animals in captivity had attained such large proportions and importance in this island that its fame had spread far and wide. Though speculators have done much to discredit the industry it is now a thoroughly established fact that in the domestication of such good fur-bearing animals as the fox, beaver, mink, lynx and muskrat, Canada possesses a resource which, if developed scientifically and on sound lines, is capable of enormous expansion.

Fox Ranches.—In the province of Quebec the territory between the strait of Belle Isle and the Saguenay river produces the finest of black and silver foxes. Excellent success in breeding the fox has been achieved by Mr. Johann Beetz, who attempted fox ranching about 1898 at Piashti Baie on the north shore of the Gulf of St. Lawrence with a pair of silver foxes from Alaska. He increased his stock with native Quebec wild foxes and has successfully bred silver black foxes in his ranch at Piashti Baie for over twenty years. Mr. Beetz has recently stocked a second ranch at Vaudreuil.

There are many fox ranches in the province at the present time. Messrs. Holt, Renfrew & Co., are operating two very commodious and modern ranches at Loretteville and at Bourg Royal. The foundation stock for the latter ranch was a litter of silver foxes from a pair of exhibition foxes in their menagerie at Montmorency Falls. The Hudson Bay Black Fox Company, Limited, with an authorized capital of $60,000, has its ranch at St. Catherines, Portneuf county. In the Gaspé peninsula where the fur-farming industry is attracting widespread attention, the Gaspé Fur Farmers Company, Limited, and a number of independent individual enterprises are meeting with much success. In addition to the places above mentioned other important fox ranches are situated at Grand Cascapedia, La Tuque, Eastman and in the Lake St. John and Abitibi districts. A permit has been taken out for capturing and keeping foxes in captivity for breeding purposes even as far north as Ungava bay. Fox farming undoubtedly promises to become a very important factor in the future prosperity of the province.

Domesticating Other Fur-Bearers.—The raising of other fur-bearing animals has recently been engaging much more attention, and experimental work in this connection is constantly being conducted. There have been many mink ranches established in America and there are quite a number in Canada at the present time. All the attempts now being undertaken in Canada to raise mink in captivity are of too recent date to enable any general conclusions to be reached. Unfortunately, no record seems to have been kept of the experiments conducted several years

See also page 42

ago. The work carried out by the Messrs. Valiquette during the years 1912 to 1915 led them to the inference that the mink is an animal requiring plenty of free space where it can search for its own food. The most pretentious mink farm in the province is possibly that of La Compagnie Zootechnique de Labelle, Limitée, situated on an island in Lac Chaud in the Laurentian highlands of Quebec. This company was the pioneer in the mink-raising industry in this province, and, encouraged by the success of its operations, it is now paying attention to the raising of beaver and fox.

The Standard Fur Farming Company is engaged in the breeding of muskrat and mink on its ranch at Rock Island. Several applications have recently been made to the provincial Department of Colonization, Mines and Fisheries for permits to catch, keep and breed in captivity all the smaller fur-bearing animals. The annual fee for these permits is fixed by the minister of the above-mentioned department, and each holder of such permit must report to the minister on or before November 15 in each year the number of animals held in captivity, the number sold and the number which died during the year, and also the number and value of animals or pelts exported out of the province.

The amount of valuable fur pelts produced in Canada was considered sufficient to warrant the establishment of a fur auction in Montreal. Accordingly, the Canadian Fur Auction Sales Company, Limited, was established in that city and the first sale held on March 22, 1920. These sales are held at regular intervals so that trappers may ship direct to the company and receive the benefit of the highest price, something they were formerly unable to do. Previously Canadian furs were auctioned at London, New York and St. Louis, as much as $14,000,000 worth being sent in one year.

A PULP AND PAPER MAKING CENTRE

View of Hull, Quebec, and Ottawa, Ontario. These immense plants, furnished with power from the Ottawa river, manufacture pulp, paper, fibreware, matches and woodenware.

CHAPTER VIII

Manufactures

QUEBEC has special advantages for manufacturing in its supply of raw materials, abundance of cheap power and plentiful supply of labour. Water-power developments at Shawinigan Falls, in the vicinity of Montreal, and in the Eastern Townships have made the portions of the province within transmission distance of these points, the centres of a thriving manufacturing industry. One of the most important classes of manufactured products is that which includes pulp, paper, lumber and articles made from wood. This is a class which needs abundant supplies of forest products and cheap power, and of both Quebec has more than her share. Closely allied with cheap power, also, is the chemical industry, an important centre of which is growing up about Shawinigan Falls. The

COTTON MILLS AT THREE RIVERS

Abundant labour and favourable transportation facilities are two of the factors that have led to the establishment of large textile mills in Quebec.

industries in Quebec using forest products as their raw materials and the production of electric light and power stand at the head of the list of manufacturing industries in point of capital invested.

Reliable Labour Supply.—Possibly nowhere in America are labour conditions more stable and satisfactory from the manufacturer's point of view than in the province of Quebec. The supply is ample. Indeed, so large has it been that for many years there has been a steady drift of population into the manufacturing towns of the New England States, but every effort is now being made to retain such an asset for the province. The French Canadians raise large families (twelve children in a family are

COLD STORAGE PLANT, MONTREAL HARBOUR
This is the largest and one of the best equipped plants of its kind in the world. Total capacity 4,600,000 cubic feet.

common) and as a race they are industrious and thrifty, whilst their religious teaching influences them against detrimental associations with international labour organizations.

Leading Industries.—Undoubtedly it is because of the supply of dependable and cheap labour that Quebec has become the leading province in the manufacture of textiles. Cottons, woolens, knitted goods, and ready-made apparel are manufactured on a large scale. Cotton textile industries, consisting of 21 establishments, in 1921 produced goods to the value of approximately $53,000,000 or about three-quarters of the total production of Canada. The capital invested in these industries in the province was about $46,000,000. No doubt, also, favourable labour conditions are largely responsible for the development of large manufacturing industries in boots and shoes, rubber goods, cigars and tobacco. Other important industries are milling, meat packing, tanning, brewing and malting and the manufacture of paints and varnishes, machinery, electric apparatus, engines and boilers, iron and steel goods and foundry

and machine shop products. Sugar refining, brick-making, cement-making, ship-building and the manufacture of asbestos products, and agricultural implements are important industries.

Statistics of Manufactures.—According to the industrial census of 1920 there were 11,518 manufacturing establishments in the province. The capital employed was $1,030,570,065 and the value of the products turned out $1,120,263,564. Total number of employees was 205,107.

Supplying the Foreign Market.—In addition to the natural advantages the province has to offer the manufacturer, the preferential tariff has induced many United States companies to build branch factories in Quebec to serve not only the Canadian market but foreign fields as well. This movement has been particularly strong during the last few years, many large companies whose head offices are in the United States, supplying their whole foreign demand from branch factories in Canada. Excellent railway facilities and communication with the Atlantic through the St. Lawrence waterway make the province a favoured location for these branch factories.

APPENDICES

APPENDIX I

Settlement Areas

IF the territory known as New Quebec, formerly the district of Ungava, be omitted, old Quebec comprises an area of 351,873 square miles, a small portion of which has been organized into municipalities. To June 30, 1922, the area of subdivided lands amounted to 7,978,030 acres representing the area at present available for settlement.

As the land is cleared the Provincial Government surveys new townships and sells lots at 60 cents per acre. The settler pays one-sixth of the price of sale on taking out a location ticket and the remainder in five equal annual instalments, and after having fulfilled certain conditions, he receives full title of ownership. The acreage that has been sold in each year since 1913 is as follows:

Year	Acres
1913	195,372
1914	203,276
1915	206,915
1916	207,530
1917	256,740
1918	307,468
1919	372,166
1920	387,900
1921	178,626
1922	221,362

The most important of the newer districts open for settlement are Timiskaming, Abitibi, Gatineau, Labelle, Mattawinie, Lake St. John, Temiscouata, Matapedia and Chaleur Bay. The regions that appear to be preferred by settlers are Abitibi, Timiskaming and Matapedia.

ABITIBI

Abitibi district is situated in the county of Abitibi, between the province of Ontario and Bell river. It extends south from the forty-ninth parallel of latitude to the Ottawa river and includes an area of about 8,000 square miles, over fifty per cent of which is well suited for the growth of field crops.

The Clay Belt, in which this district lies, is known to extend as far as 120 miles north of the Canadian National railway, and, except for a few patches of marsh land and sandy ridges, the whole clay area is suitable for

agriculture. Around lakes Soskumika, Mattagami, and Olga very large tracts of suitable farm lands exist, but some of the very best stretches of good land are found along the Nataganan and Allard rivers. Even as far north in this zone as lake Waswanipi, the Hudson's Bay Company grow crops of potatoes and vegetables every year. The soil, though invariably acid, consists of bluish or reddish clay with ten to twenty per cent of fine sand and is covered with a layer of humus and decayed vegetable matter varying from four inches to seven or eight feet in depth. It is well provided with the essential elements of fertility, namely, nitrogen, soluble phosphates and potash, and its pronounced acidity might be easily corrected by proper liming; but, even without the addition of any commercial fertilizer, biological and chemical changes in the soil resulting from aeration due to drainage and tillage are sufficient to develop a medium favourable to the growth of thrifty crops. If it is necessary to add lime to prevent the waste of fertilizing elements, the fact ought to be previously established by chemical analysis.

Farming has been carried on around Lake Abitibi and along the railway from La Reine to Senneterre with very satisfactory results. The clearing of the land requires but comparatively little work because of the shallow rooting habits of the forest in this region. The whole operation might be completed in a very short time, but, as a rule, the work is distributed over a longer period, partly for economy of labour and also to secure greater productivity of the soil, whose physical condition is considerably improved by the partial decay of the roots of the stumps after the trees have been cut. In the meantime, shallow cultivation between stumps, while hastening the rot of the organic refuse left on and within the soil, gives the settler generous immediate returns in the form of potatoes, grain and hay. In addition, he secures cash for his pulpwood, the yield of which averages about 10 cords an acre.

Not infrequently, though, a thick layer of peat-moss interferes with immediate cultivation and repeated burning has to be resorted to. In a few cases, some kind of rough drainage must be provided. The success of the burning operation is dependent on favourable climatic conditions. Too often, after the fire has passed again and again over the same spot, very little humus is left, stumps and moss alike having been consumed. The use of fire in such a severe way is likely to endanger the fertility of the soil, but if the season has been carefully selected there remains sufficient moisture in the black muck layer underneath the moss to check or even stop, the activity of the destructive element. After burning, immediate plowing is possible, as the land in Abitibi is absolutely free from boulders and stones of any kind. Except in swampy areas, where drainage has to be provided by means of trenches, the average soil of this region, which is a gently rolling land, may be freed of its surface water by appropriate plowing.

The forest products for 1919 comprised 64,468 cords of pulpwood, 245,544 railway ties, 3,752 piles, 21,000,000 feet of spruce and balsam, 1,000,000 feet of boom timber, 785,000 feet banksian pine, 11,000 feet of cedar, and 926,000 feet of poplar. There were forty saw-mill owners and forty-one merchants representing outside firms who carry on the lumber trade in this district. The shipments included 2,910 carloads of lumber, 1,540 carloads of railway ties, 2,500 carloads of pulpwood, and 120 carloads of piles.

Although vegetation is remarkably rapid on account of the long days and short nights in the summer months, seed must be sown as early as possible. Experiments so far have shown that wheat, peas, and vegetables sown in the first week of May ripen before the autumn frosts. To ensure a good crop, fall ploughing is advisable, as spring ploughing is likely to give unsatisfactory results.

Contrary to the opinion which seems to prevail outside the district itself, Abitibi is not a region of wet soil. There is a certain proportion of peaty lands, but the rest of the country, thanks to its undulating surface and to the impermeable texture of the sub-soil, ought to be classed among the dry lands. Most singularly, meteorological conditions favourable to vegetation there do not exclude even very considerable rain provided it is distributed uniformly throughout the season, that it is frequent enough and that the volume of each precipitation is not excessive. Whilst a considerable fall in temperature, after a shower, may at certain times result disastrously to tender crops, at other times vegetation is not seriously affected, and that precisely because the dryness of the atmosphere and the absence of excessive humidity in the soil.

The total area under cultivation in 1918 showed an increase of 1,763 acres over that of 1917 and now amounts to 9,332 acres of which 5,885 acres were under hay and clover, 2,392 under oats, 390 under potatoes, 271 under barley, 214 under vegetables, and 88 acres under wheat.

The population in 1922 was nearly 16,000 and the townships are being rapidly organized. Amos, Privat, Makamik, La Sarre, Dupuy, Villemontel, La Motte, Landrienne, Senneterre and La Reine, Authier, Barraute, Figuery, Goulet and Harricanaw, have resident parish priests and excellent municipal and school organizations.

The climate of this district has been said to be the chief drawback to what would otherwise be a splendid agricultural district. This opinion, probably based on observations made when colonization was beginning, or even before, needs to be revised since forest fires have diminished evaporation by laying bare the soil to the sun, thus warming the atmosphere. The notable improvement thus affected gives some idea of what the climate of Abitibi may become when the work of clearing will have removed the forest from considerable extents of territory, when the draining

of peaty lands will have diminished evaporation and when proper methods of cultivation will have increased the power of the soil to absorb the heat of the sun.

The altitude diminishes toward the north so that the northerly part compares favourably with the southerly. Spring break-up occurs at the end of April and freeze-up comes near the first of November, but frosts are liable to occur during every month of the year. The annual precipitation is about twenty-eight inches but in 1918 it was as high as thirty-four inches. The greatest precipitation is during late September and October.

THE FIRST CROP ON A COLONIZATION FARM
The lot of the pioneer is not always a bed of roses, but in Quebec a fertile soil is sure to reward his efforts.

During summer the nights are cool and the days normally very hot. A hot, dry spell in summer is sometimes followed by a storm with a sudden drop in temperature accompanied by rain or hail. Such a phenomenon, however, seldom occurs in the southerly part of the district, being confined to the lower Harricanaw area, which lies some hundred miles north of the region now being colonized. In this, as in other districts, summer frosts will disappear as the land becomes settled and cultivated.

TIMISKAMING

The Timiskaming district is situated in the westerly part of Quebec, south of Abitibi. It extends easterly from the province of Ontario to Great Lake Victoria and northerly from Kipawa lake and river to lac des Quinze. The total area includes about 3,500,000 acres, or 35,000 farms of 100 acres each. At present only about 33,000 acres are under cultivation and the population numbers about 9,000.

The most suitable portion for colonization lies along the eastern shore of lake Timiskaming and along des Quinze river. The whole district lies in the clay belt and is good for agriculture. A branch of the Canadian Pacific Railway crosses the district, running from Kipawa to lac des Quinze. It is now rumoured, that this railway will soon be extended to the Rouyn goldfields.

The land in this district is composed chiefly of grey, yellow, and black loam with clay subsoil, and produces abundantly all the cereals, vegetables and fodder plants.

Ville Marie, the most ancient parish of Timiskaming, is also the most important and has a population of about 1,200. It is situated on the eastern shore of lake Timiskaming and is an active business centre. The Crown Lands and Timber agent for the district is located there and colonists may obtain from him the prices of lands for settlement and the relative values of the different soils. Ville Marie is also the seat of the Mining Recorder's office.

The two best townships are Guerin and Latulipe, the former opened for colonization in 1907 and the latter in 1910. These townships are heavily timbered which furnishes a source of revenue while the farms are being cleared, as a market for all lumber products is easily obtained.

Unlike the Abitibi district there are no boulders, or at least very few, and the soil being a clay loam the tree roots do not grow to a great depth. The result is that stumps are very easily removed the second year after being cut, and the land made ready for the plough. The soil is very productive. It is to the north of this splendid region that are found the gold mines of Rouyn, now causing considerable excitement.

MATAPEDIA

The Matapedia valley comprises the county of Matapedia, the southern portion of Matane county and the westerly part of Bonaventure. It extends from St. Moise to Restigouche river, being 60 miles from east to west and 25 miles from north to south, and contains an area of about 1,500 square miles. It is traversed throughout its length by Matapedia river and the Canadian National railway, which give easy access from all the settlements to Quebec, Montreal, or the maritime ports to the south and east.

The land is neither stony nor hilly and the soil is very fertile throughout, while the climate is about the same as that of Quebec., although the summer is two weeks shorter. Owing to the unknown quality of the land the district was for a long time avoided by settlers, but to-day the region is attracting numerous farmers so that in some parts large parishes have been settled and are completely organized, while in others recently opened up all the lots suitable for agriculture have been taken. Considerable good land still remains to be settled. At present the population of the district is about 20,000 and it is rapidly increasing.

Seeding takes place during May and harvesting as late as October, the danger from frosts even at that date being small. Drought affects the Matapedia valley less than other parts of the province as the very heavy dews which fall provide a great deal of moisture for the plant life.

Six parishes were recently opened for settlement and all the lots suitable for agriculture are for sale without reserve. In addition to the settlers already located, seven or eight hundred more families could be

A VIEW IN THE BEAUTIFUL MATAPEDIA VALLEY
The magnificent Gaspé region is a paradise for the artist, tourist, angler and hunter.

placed, and when these parishes are filled new ones will be ready to be opened up for settlement by the Provincial Government. In the last ten years great inroads have been made into the forests of the Matapedia valley as a result of the high prices that have prevailed for all forest and farm products and many industries have been established affording a ready market for the farmers. Among the regions where settlement has made great progress must be mentioned Sayabec, St. Zenon d'Amqui, St. Viennay, St. Leon le Grand, Lac au Saumon, Albertville and Ste. Florence de Beaurivage.

LAKE ST. JOHN

The picturesque valley of lake St. John comprises at least 4,000,000 acres, a large percentage of which is favourable to agriculture on account of the fertility of the soil and the mildness of the climate. Slightly over 1,000,000 acres are at present occupied by settlers. Fifty years ago the lake St. John district was but a vast solitude, its silence only interrupted by the passing hunter or Indian. Now it is interspersed with villages and

clearings and traversed by convenient roads, and the population numbers 70,000. Settlement surrounds the lake and is expanding towards the north and west. Among the principal townships offering the greatest opportunities for increased settlement at the present time are Dalmas, Dufferin, Girard, Delisle, Garnier, Taillor, Labreque, Begin and Dolbeau.

The soil for the most part is a clay loam of great depth that is covered in most places with a layer of sand which when mixed with the underlying clay gives a soil very fertile and easy to plough. A few swamps are to be found here and there but they can be made productive without much difficulty by surface drainage. When the surface of the land has been drained, the brushwood and the layer of black loam are burnt, care being taken to preserve a sufficient quantity for admixture with the clay subsoil. This has been the reason for the formation of important parishes where farms to-day are quoted at $10,000 to $25,000.

This is a splendid agricultural country where almost everything that the Canadian soil produces is cultivated with success, including tobacco and fruits requiring a mild climate. The great richness of the pastures has given a strong impulse to dairying. This rapidly growing industry already provides a livelihood for thousands of farmers. There still remain over 2,500,000 acres untouched by the plough. The temperature of the lake St. John valley is almost identical with that of Montreal. A chain of hills pleasantly shelters it from unfavourable winds, especially the northeast wind which blows so severely in the lower regions of the St. Lawrence. Rain is not excessive and snowfalls are lighter than in Quebec and Montreal.

The great forest wealth of the lake St. John and the Chicoutimi districts has given rise to the establishment of a number of prosperous pulp and paper industries of which those at Chicoutimi, Jonquière, La Tuque, Ouiatchouan and Petite Peribonka are the most important.

North of lake St. John the land becomes a fertile plain excellent for settlers who will have a ready outlet in the Peribonka river right at their doors, while in the whole range of more or less unexplored territory extending northwest of lake St. John to lake Mistassini, there may be possibilities in the timbered lands and in the discovery of mineral wealth.

TEMISCOUATA

The Temiscouata district lies on the south bank of the St. Lawrence between the counties of Rimouski and Kamouraska and borders the province of New Brunswick and the state of Maine. It is served by three railways: one skirting the St. Lawrence, another, running across the middle of the county, while the third traverses the southwest.

The townships that are much favoured for colonization purposes are Estcourt, Botsford, Packington, Raudot, Robitaille, Cabano, Robinson, and the parish of St. Dominique in the adjacent seigniory. The soil in these localities is eminently suited for all kinds of crops. It is usually a

yellow to grayish black loam, the areas that are sandy and gravelly being few. In the picturesque valley of the Squatteck river and lakes the soil is exceptionally good.

The climate in the growing months, being tempered as it is by the lakes, is warm and even.

In the central and southern portions of the county the dense forests that contain magnificent specimens of cedar and many maples have given rise to the erection of a number of saw-mills and to the making of pulpwood.

CHALEUR BAY

The Chaleur Bay, or Gaspesian, district includes the two counties of Bonaventure and Gaspé and comprises an area of over five and a half million acres. The Chaleur Bay railway connects with the Canadian National railway at Matapedia and runs along the bay to Gaspé. The great unexplored area in the centre and north of the county of Gaspé has no railway service, the Canada Gulf Terminal railway only operating at present as far as Matane in Matane county.

For many years the belief prevailed that it was purely a fisherman's country as the majority of the inhabitants were engaged solely in the development of the cod and salmon fisheries, and it is only comparatively recently that the agricultural possibilities have been recognized. The land is fairly easily cleared; the soil is good with a natural drainage, and the Gaspé fisheries present an opportunity for the preparation of artificial fertilizers from fish waste and seaweed. The climate is equable with rain and snow in moderation, and seeding can be commenced early in May. Small fruits are grown very successfully and excellent apple orchards are to be seen, especially at Paspebiac, Bonaventure, New Richmond, and Caplan.

The area under cultivation is only a strip along the coast of the Chaleur bay and comprises but a small area of such agriculturally suitable townships as Matapedia, Restigouche, Hamilton, Richmond, Cox, Hope, and Port Daniel in Bonaventure county, and Malbaie, Douglas, Gaspé and the seigniorie of Pabos in the county of Gaspé. In the township of Percé the land is exceptionally good, a deep, red soil, free of stones. It stretches back from the coast for a considerable distance and is cut by numerous streams abounding in salmon.

LABELLE

The Labelle colonization district lies northwest of Montreal. It is very rocky and hilly but the land is good and well suited to dairy farming and the raising of cattle. It is well watered by the Lièvre, Kiamika and Rouge rivers whose valleys shelter a number of prosperous farmers.

Other colonization regions similar in character to the Labelle territory are the Gatineau region west of Labelle county and the Mattawinie district north of Joliette. In the foregoing colonization areas of the province

of Quebec lots are procurable on the terms cited on page 106. Additional information and full particulars respecting any locality can be obtained by writing the Department of Colonization, Mines and Fisheries, Quebec.

EASTERN TOWNSHIPS

The Eastern Townships is a name that has been applied for years to the aggregation of townships in the counties of Brome, Compton, Drummond, Arthabaska, Megantic, Missisquoi, Richmond, Wolfe, Shefford, Sherbrooke and Stanstead. The area of this district, which is one of the most fertile of the Dominion of Canada, comprises 4,444,868 acres with a population of about 250,000. As early as 1784 a settlement was established on the shores of Missisquoi bay by a hardy band of pioneers comprising many United Empire Loyalists who had served on the British side in the American revolution. They purchased land at 50 cents an acre and the successful outcome of their venture resulted in the yearly arrival of newcomers attracted by the wonderful productivity of the soil, so that to-day this district has become a well-settled and prosperous dairy farming country.

Everything that a rich soil and a temperate climate can produce is grown in the Eastern Townships. It is an ideal stock-raising and mixed-farming country. There are not to be found here the extensive acreages of wheat that prevail in Western Canada nor are there to be seen imposing fruit orchards as those of the Niagara peninsula. The farmer, however, raises wheat for his own use and grows apples as fine as any produced in Canada. The typical farm consists of 250 acres and is divided into three sections, cultivated land, pasturage, and timbered land.

Though there are just a few Crown lands available in the Eastern Townships, this district is easily capable of sustaining more than double its present agricultural population. The belief has gained ground that it is thickly settled, but, as a matter of fact, the population per square mile is only 34 and the total population about a quarter of a million. Even in Brome county, which is one of the best agricultural sections of the district, there are but 27 inhabitants to the square mile. This compares with 500 to the square mile in the European dairying country of Holland, and 344 in the United Kingdom.

APPENDIX II

Aids to Settlement of Returned Soldiers on Crown Lands

PROVINCIAL LEGISLATION.—Provision has been made whereby the Lieutenant-Governor in Council may set aside the land necessary for settlement:

(*a*) By soldiers who have served in the naval or military expeditionary forces of Canada during the recent war; or,

(*b*) By soldiers who have been engaged in active service during the recent war in the naval or military forces of the United Kingdom, or of any of the self-governing British Dominions or colonies, or,

(*c*) By soldiers who are British subjects and have been engaged in active service at one of the seats of war in either the naval or military forces of any of His Majesty's allies; in the recent war; or,

(*d*) By soldiers of other nationalities, who resided in Canada before the war, and were engaged in active service at one of the seats of war, in the recent war, in either the naval or military forces of one of His Majesty's allies;

PROVIDED that such soldiers have left the forces with an honourable record or have been honourably discharged.

The land shall be gratuitously conveyed by the Minister of Colonization or his authorized agents.

FEDERAL LEGISLATION

The Soldier Settlement Board was created with the object of settling on the land those duly qualified whose interests will be best served by farming, and that only on such agricultural land near an existing railway as can be made a productive holding for a home.

The Board exercises its powers under the Soldier Settlement Act of July 7, 1919, the main provisions of which are:

1. Loans are made to approved settlers purchasing land through the Board as follows:

(*a*) Up to $4,500 for purchase of land. Except in special cases 10 per cent of the purchase price is payable by the settler in cash.

(*b*) Up to $2,000 for purchase of live stock, implements and equipment.

(*c*) Up to $1,000 for erection of buildings and other permanent improvements.

NOTE.—The loans are repayable in twenty-five equal, annual instalments; interest at the rate of 5 per cent amortized.

2. Loans to approved settlers who already own land are made up to $5,000 on first mortgage security for agricultural purposes or for discharge of loans on agricultural land. Such loans are repayable in not more than 25 annual instalments with interest at 5 per cent amortized.

All expenditure of loans is under the direct supervision of the Board Eligible applicants are:

(*a*) Discharged members of the Expeditionary Force of Canada, Great Britain or any self-governing Dominion who have served overseas.

(*b*) Discharged members of the Allied Forces who were British subjects resident in Canada before the war and who have served in an actual theatre of war.

(*c*) Disabled members of the Canadian Expeditionary Force who, though not serving overseas, have been incapacitated for military service and have therefore received a pension.

(*d*) Widows of such men of the above classes as have died on active service.

Full information may be obtained by applying to the District Superintendent, Soldier Settlement Board, Sherbrooke, Que.

APPENDIX III

Pulp and Paper Mills in Quebec

The following table gives a list of the pulp and paper mills in Quebec, together with their location, product and daily output. Nearly one-half of the pulp mills in Canada are situated in the province.

Firm	Location of Mills	Product	Daily Output
			Tons
Atkinson, Henry, Reg'd	Pont Etchemin	Groundwood	14
Back River Power Co. Ltd	Sault au Recollet	Building	15
		Board	4
Bay Sulphite Co., Ltd	Port Alfred	Sulphite	150
Belgo Paper Co., Ltd	Shawinigan Falls	Groundwood	245
		Sulphite	90
		News	365
Bennett, Ltd	Chambly Canton	Binder, heeling and fibre board	12
Bird and Son, Ltd	Pont Rouge	Building and wrapping	35
Bishop & Sons, Ltd	Portneuf	Roofing felt	16
Brompton Pulp & Paper, Co., Ltd.	Bromptonville and East Angus	Groundwood	220
		Sulphite	110
		News	120
		Boxboard	60
		Wrapping	30
Brown Corporation	La Tuque	Sulphate kraft	200
Canada Paper Co., Ltd	Windsor Mills	News	45
		Wrapping	15
		Coloured	15
		Groundwood	50
Canadian Paper Board Co., Ltd	Montreal	Board	125
		Groundwood	30
Chicoutimi Pulp Co	Chandler	Sulphite	125
Chicoutimi Pulp Co	Chicoutimi	Groundwood	400
Chicoutimi Pulp Co	Val Jalbert	Groundwood	100
Donnacona Paper Co., Ltd	Donnacona	News	200
		Sulphite	50
		Groundwood	120
Dominion Paper Co	Kingsley Falls	Sulphate	6
		Wrapping	15
		Groundwood	7
Donohue Bros	Murray Bay	Mechanical pulp	120
Eddy, E. B. Co., Ltd	Hull	Groundwood	80
		Sulphite	50
		Book, writing and tissue	8
		Cardboard	22
		News	55
		Wrapping	20
		Bag manilla	8
		Also produces fibre ware, paper bags, toilet papers and matches.	
Ford, Joseph & Co	Portneuf	News and miscellaneous	12
		Felt and sheathing	15
Ford, Rowland & Son	Portneuf	Roofing and carpet felt	5
Forest Products Laboratories of Canada	Montreal	Experimental work only.	

PULP AND PAPER MILLS—*Concluded*

Firm	Location of Mills	Product	Daily Output
			Tons
Gulf Pulp and Paper Co	Clarke City	Groundwood	150
International Paper Co.; St. Maurice Lumber Co., Paper Mill	Three Rivers	News	260
		Mill wrappers	8
		Sulphite	55
		Groundwood	210
Laurentide Co., Ltd	Grand Mere	News	375
		Pulpboards	50
		Sulphite	150
		Groundwood	350
Lotbiniere Lumber Co	Nicolet Falls	Groundwood	50
McLaren, The James, Co., Ltd	Buckingham	Groundwood	75
McArthur, Alex. & Co	Joliette	Building, wall, wrapping and coloured	23
News Pulp & Paper Co., Ltd	St. Raymond	News	30
		Groundwood	40
Price Bros. & Co., Ltd	Jonquiere and Kenogami	Groundwood	335
		Woodboards	25
		News	400
		Sulphite	110
Price Porritt Pulp & Paper Co	Rimouski	Groundwood	42
Richard & Co	L'Ange Gardien and Les Saules	Leather, counter, friction and fibre board	6
Riordon Co., Ltd	Timiskaming	Sulphite	180
Rolland Paper Co., Ltd	Mont Rolland and St. Jerome	Ledger and book, bond and writing	25
Ruberoid Felt Co., Ltd	Portneuf	Roofing, carpet and building felt	18
Smith, Howard, Paper Mills, Ltd.	Beauharnois	Groundwood	30
	Crabtree Mills and Cornwall, Ont.	Sulphite	60
		Book	15
		Writing	60
		Blotting	15
		Covers, etc	5
Soucy, F. Flo	Old Lake Road	Groundwood	10
St. Lawrence Paper Mills, Ltd	Three Rivers	News	160
		Groundwood	140
St. Maurice Paper Co., Ltd	Cap Magdeleine	Groundwood	200
		Sulphite	60
		Sulphate	65
		News	115
St. Regis Paper Co. of Canada, Ltd		Lumber and pulpwood. To build pulp and paper mill.	
Valleyfield Coated Paper Mills, Ltd	Valleyfield	Coated book and litho	5
		Coated board	5
Kenneth L. Warren Co	Riviere du Loup	Groundwood	40
Wayagamack Pulp & Paper Co., Ltd	Three Rivers	Sulphate kraft pulp	260
		Kraft paper	125
Wilson, J. C. Ltd	St. Jerome and Lachute	Groundwood	15
		Wrapping	40

APPENDIX IV

New Quebec or Ungava

NEW Quebec, or the peninsula of Ungava, extends roughly north of a line from the mouth of Eastmain river to Hamilton inlet, except a strip of coast line on the east side called Labrador which belongs to the Dominion of Newfoundland. It comprises an area of over 350,000, square miles or about half of the land area of Quebec.

The boundary between Labrador and Quebec has never been accurately determined. The need for accurate location has only arisen once when the Newfoundland Government issued licenses to a lumber company operating on the upper reaches of Hamilton inlet and collected the custom duty thereon. The province of Quebec made a technical seizure of the logs cut on the south side of the inlet over which area they claimed ownership and the location of the boundary was referred to the Privy Council. No decision has yet been given but active investigation has been going on recently both on the site of the proposed boundary and in the historical records of all the countries who claimed sway over the adjoining territory, so that a decision will, in all probability, soon be rendered.

The surface of New Quebec is rough and rocky in places. The highest portion is along the eastern part where hills rise to a height of 6,000 feet. In the interior, elevations are over 2,000 feet, while along the Hudson bay coast the surface is only a few hundred feet above sea-level. Large rivers flow north and west, and the interior abounds with lakes which are connected by small streams so that it is possible to travel by canoe almost anywhere with a few portages. The size of the lakes varies from 500 square miles to 50 and, while there are only two of the larger size, there are dozens ranging around 200 square miles. In the streams between the lakes the descent is usually abrupt and a large amount of power could be developed as the flow is fairly uniform.

AGRICULTURE

The climate ranges from cold temperate to Arctic on Hudson strait. From careful perusal of all authorities, one is led to the conclusion that the only part of this territory that might have any agricultural value, is the low-lying region to the east and southeast of James bay. The temperate climate may be taken to extend to cape Jones, or, in other words, to be limited to the shores and vicinity of James bay.

Outside of this temperate region the following facts have been obtained. On the Atlantic coast (Labrador) the climate seems to be much more rigorous than inland, being governed by the cold Arctic current which sweeps this coast. Thus at Rigolet (Labrador) on Hamilton inlet in latitude 54°, turnips, radishes, and lettuce have been grown but potatoes

cannot be profitably raised. Directly west and inland from this place, however, at Northwest River and at the mouths of Kenamou and Hamilton rivers good crops of potatoes and other garden vegetables are grown annually, and it is said that oats will readily ripen. At Nain, latitude 56° 30′, garden vegetables are grown but extraordinary precautions must be taken with them. At Chimo, latitude 58°, near the mouth of Koksoak river, Ungava bay, where the climate is Arctic, small patches of turnips, lettuce, and radishes have been grown with care.

The whole interior of Ungava is a high plateau rising somewhat abruptly within a few miles of the coast line to heights of from 500 to 2,500 feet. Even if altitude and climate permitted, the soil on this immense plateau is, on the whole, thin and poor. The Hudson's Bay Co.'s posts at Mistassini and Nichikun are situated on this high interior plateau. The soil at Mistassini, which is 1,200 feet above sea-level, is reported to be a good boulder clay. A crop of potatoes is raised annually, but, owing to the shortness of the season and the prevalence of summer frosts, they rarely mature without the tops being frozen. At Nichikun, 1,760 feet above sea-level, the attempts to grow potatoes have nearly always failed.

At the Hudson's Bay Company's post near the mouth of Great Whale river, on the Hudson bay coast, sandy soil aids the climate to prevent the successful cultivation of any crop.

Along James bay, south of cape Jones, the low land extends inland from ten to thirty miles. The general level is not much over 100 feet above sea-level, and the soil is of Post-Pliocene clays and sands, with alluvium, affording good land for cultivation. At Fort George, near the mouth of Fort George river, good crops of potatoes and other roots are grown annually and cattle are also kept. Farther south the Hudson's Bay Co. kept a small trading post at the mouth of Eastmain river, which was in reality more a farm or ranch, and abundant crops of wild hay were harvested there yearly. A large herd of cattle and a number of sheep were kept, and the surplus stock was distributed annually to Rupert House and Moose Factory. Root crops are grown to perfection. At Rupert House, on the southern shore of James bay, excellent root crops are grown annually and oats have been successfully raised.

According to Dr. A. P. Low's report the large area of country situated to the south and southeast of James bay and underlain by good clay soil capped with sandy loam would, with proper drainage, make excellent farming land capable of raising any crop grown in the Northwest Territories.

In 1877 Dr. R. Bell made a tolerably complete collection of the plants of the Nottaway river region and Professor John Macoun after carefully identifying the species, said that, judging from the flora, he saw no reason why wheat might not be successfully grown as a crop. In 1896 Mr. D. Baxter, in charge of Waswanipi post (in the Nottaway river district, 122 miles south of Rupert House), kindly agreed to make some additional experiments with wheat, oats, barley, and a variety of other seeds which

were sent him from the Central Experimental Farm. When Dr. Bell visited this post on August 12 the various grains looked well. They had headed out some time before and would soon be ripe. New potatoes were as large as hens' eggs, turnips six inches in diameter, and carrots and some other vegetables ready for use. Indian corn was showing its silk, tobacco plants were growing well, and almost every kind of garden crop grown in an average district of Canada, was flourishing under Mr. Baxter's care.

CLIMATE

Of the year of Dr. Bell's visit to James bay, which, however, was an exceptionally fine one, he writes: "The superiority of the weather over that of lake Superior was a subject of frequent remark among my voyageurs, who had been accustomed to that lake all their lives," and further, "We bathed in the salt water almost daily, and found the temperature agreeable."

Dr. Bell also says that the climate along James and Hudson bays, especially beyond the limits of timber, is rather dry in all years. Considerable rain falls in the spring and autumn, but little in the summer, and little snow in winter. On the other hand, south of James bay these conditions seem to be reversed and a copious rainfall is the normal condition in the Nottaway river district, and the average depth of snow at Waswanipi is considerably more than four feet.

On the Labrador coast, as before mentioned, the climate some miles inland is much superior to that of the coast, exposed as it is to the cold Arctic currents. At Chimo light rains and showers are frequent during the summer months, but the total rainfall is not great.

TIMBER

The forests of Ungava are continuous over the southern part to between latitudes 52° and 54°, the only exceptions being the summits of rocky hills and the outer islands of the Atlantic coast. To the northward of latitude 53°, the higher hills are treeless and the size and number of the barren areas rapidly increase. In latitude 55°, more than half the surface of the country is treeless, woods being found only about the margins of small lakes and the valleys of the rivers. Trees also decrease in size until, on the southern shore of Ungava bay, they disappear altogether.

A line drawn from the mouth of Leaf river, Ungava bay, in a southwesterly direction to the mouth of Nastapoka river on Hudson bay, would give a close approximation to the northern tree limit of Ungava.

Owing to the great prevalence of forest fires it is impossible to give, with any degree of accuracy, much information respecting the present condition of the timber. Timber of commercial value was, at the best of times, very limited.

Along Hamilton inlet the sides and tops of the hills are almost totally devoid of trees owing to the blasts of the prevailing cold north winds that sweep across the bay especially during the winter season. Inland it is

reported that small trees grow abundantly in protected valleys. As the head of the inlet is approached the trees cover the lower slopes and rise higher and higher until near the mouth of lake Melville they extend to the very tops of the hills from 600 to 800 feet high. The shores of the outer part of the inlet are partly wooded with black spruce and larch while the hills and islands support only a growth of low Arctic shrubs and willow. As the narrows are approached the trees become larger and on the protected north side cover the hills to their tops. White spruce, balsam, fir, and small white birch are seen. Continuing up Melville lake the trees become larger and better until on the low lands about its head plenty of trees of the above species grow to sizes that fit them for commercial purposes and aspen and poplar are abundant. At Northwest river and also at the mouths of Kenamou and Hamilton rivers good crops of potatoes and other garden vegetables are grown annually and it is said oats will readily ripen. At and below the narrows the cold Arctic currents which pass down the coast so lowers the summer temperature that potatoes cannot be profitably grown and garden crops are confined to turnips, radishes, and lettuce.

Where Hamilton river flows into lake Melville the valley is well wooded, where the country is not burnt, with timber of a fair size for commercial purposes, in marked contrast to the small stunted trees found partly covering the rolling country on the tablelands on either side of the valley.

The valley of the river westerly from lake Melville is two to five miles wide and is well wooded with spruce up to two feet in diameter and seventy feet high. The hills on both sides rise from 400 to 600 feet and are wooded to their summits, but as the upper level is approached the trees become small and stunted. Black spruce forms over 90 per cent of the wood, the remainder being larch, white birch, and balsam fir. The black spruce does not grow as large as the white spruce but is still large enough for commercial timber. Balsam fir, white birch, aspen, and balsam poplar grow up to fifteen inches.

The timber in the vicinity of Minipi river has been burned over on both sides of Hamilton river but a number of patches escaped where spruce up to twenty-four inches grows. West of Winokapau lake immense areas of timber have been burnt so that none of the original timber remains except in isolated patches, and the second-growth timber is of no commercial value.

The table-land is almost denuded by fire, only small patches of trees being left about the lakes and swamps. These consist of a thick growth of stunted black spruce and larch of no commercial value.

In the vicinity of Grand falls over half the area has been stripped bare by frequent fires. In the swamps and around the shores of the lakes where the trees are unburnt, black spruce and larch of small size grow thickly together. On the sides of the hills these trees are more stunted and are separated by open glades. Where the trees have been burnt years ago

these glades are covered with a tangled mass of willow and alder while the tops are coated with white moss and semi-Arctic shrubs and berries. Only on the banks of the river about the falls were trees large enough for commercial purposes seen. Surrounding the falls white spruce seventy feet high and two feet at the base are common, along with large black spruce, balsam fir and white birch.

Along the Nottaway river region, where the rainfall is super-abundant the forest fires are consequently not so destructive. White spruce is perhaps the most valuable tree of the district. It grows to a great size

GREAT WHALE RIVER, LOOKING EAST
One of the big rivers in Quebec's little known northland.

everywhere along the rivers and lakes, and although, as a rule, it may be larger near their banks, where it often girths upwards of six feet, a considerable proportion of the trees inland also attain a good size. In point of numbers of individual trees, the black spruce take first rank, and a large proportion of them are of a sufficient size for various useful purposes, such as fuel, buildings, railway ties, and wood for paper making. Balsam fir grows to perfection and is abundant throughout the district. White or canoe birch is a thrifty and abundant tree everywhere. The timber is almost everywhere of mature age, or consists of old second-growth, and it will be of great importance to preserve these extensive forests, as far as possible, against fires, which have wrought such havoc in so many other districts. A few square miles have been destroyed by fire in recent years on the east side of Soskumika lake, on the Nottaway, but with this exception only insignificant patches which had been burnt were noticed.

MINERALS

Of the valuable rocks labradorite is the most important. It is a plagioclase feldspar of a brilliant blue colour. In a few places the stone shows a variety of brilliant colours including green, yellow, orange, and red, and at the proper angle has a gorgeous effect. If got out unfractured on a large scale and sawn into slabs schillerized labradorite should make one of the most beautiful decorative stones imaginable.

Among the non-metallic minerals, graphite is the most important and occurs in the area west of Nachvak inlet for about fourteen miles. Most of it is in the form of disseminated scales but pieces of amorphous-looking graphite are found near the inlet. Soapstone and mica crystals are found in a number of places but their extent has never been determined.

Little prospecting has been done in New Quebec and the mineral resources are practically unknown. Iron ore appears to be the commonest and is distributed over large areas along the eastern part. A band running parallel to the coast and 200 miles inland is also known to contain large deposits of iron but the intervening country has never been prospected. Rocks resembling the Sudbury or Timiskaming series cover large areas. The lack of soil and forest cover in many places should make prospecting comparatively easy, but the difficulties of transportation and labour are too great for present development. So far as can be seen the rock conditions in Ungava are similar to those which have caused the economic deposits of the Grenville, Timiskaming, Huronian, Animikie, and Keweenawan series of Ontario and Southern Quebec, deposits which have placed these areas among the greatest mining regions of the world.

Analyses of a large number of surface samples of the hematite-magnetite ores of the Nastapoka islands show an iron-content, for the better grades of thirty to forty per cent. All the beds may not be equally rich, but the greater part of them on all the islands appear to be sufficiently so to constitute a valuable ore for the manufacture of spiegeleisen. The enormous abundance of the ore is its great feature; the iron-stone beds are spread over the greater part of their area, which, in the aggregate, amount to many thousand of acres. The islands being destitute of timber and the rocks much shattered by the frost and weather, the ore, ready broken, may be gathered up in inexhaustible quantities. The islands offer good shelter for vessels and the ore might be conveniently loaded in many places.

The high percentage of manganese (about 3.5 per cent) in these ores, renders them valuable for the manufacture of spiegeleisen, and owing to their abundance and accessibility they may some day be found worth carrying to Europe or to the United States.

Specimens of ore from the Koksoak river show from 19 to 54 per cent of metallic iron and contain no titanic acid. To the south of Swampy Bay river, exposures of iron-bearing rocks are almost continuous, and the amount of ore in sight must be reckoned by hundreds of millions of tons.

The ore is not everywhere high-grade, and probably a large proportion of it would be unprofitable to work, but there is certainly an almost inexhaustible supply of high-grade ores.

Though not a great many outcrops were found along the Hamilton river, they are sufficient to show that the deposits are widespread and that the ores will be found in practically inexhaustible quantity. Two specimens of ore from this part of the country show thirty and forty per cent of metallic iron and no titanic acid.

FISHERIES OF HUDSON BAY

In course of time it may be found that the fisheries of Hudson bay will prove to be its greatest natural resource and a great amount of wealth may be lying dormant in its waters from lack of knowledge concerning its fisheries. There is every reason to hope that, when railway communication has been established with James bay, a great Canadian fishing industry may be developed equal to the world-famous fishing industry of Labrador and the banks of Newfoundland.

Trout are usually sea-run brook trout. White-fish are identical with the lake Superior whitefish, and being sea-run, are, like the trout, much improved in flavour. These trout and whitefish vary in weight from one to six pounds and are the best of food. Similar fish are found abundantly along the entire coast to cape Wolstenholme.

The Arctic trout or Hearne salmon is found along the northern coast as far south as Seal river, which is situated a few miles south of cape Jones. This is a beautiful fish with well-flavoured, dark pink flesh, and it varies in weight from one to fifteen pounds, the average being about five pounds. These fish are salted at Chimo on Ungava bay and fetch nearly the same price in London as salted salmon from the same locality. They are very plentiful about the mouths of the northern rivers and along the coast, while the Eskimos report them abundant at the Belcher and other islands lying off the west coast. There is no doubt that this fish equals or surpasses in colour and flavour the salmon of British Columbia.

It was not definitely known that cod existed in Hudson and James bays, until Dr. Low reported in 1900 that cod were taken at cape Smith and at Comb hills near Fort George in James bay, by members of the expedition. The Eskimos also catch them in Nastapoka sound and at the Belcher islands; at a number of places in James bay they are also taken by the Indians.

The specimens of cod taken were not very large but the men who caught them were Nova Scotia fishermen and said that they were true cod and identical with those taken on the Grand Banks. Food for these fish is abundant in Hudson bay and there is no reason why extensive fisheries in this Canadian inland sea should not exist. The undoubted presence of cod in Hudson bay deserves investigation, as a very valuable and exclusively Canadian fishery may be found there. The presence of cod points to that of halibut in the deeper waters of the bay.

INLAND FISHERIES

Fish of various kinds and of large size are caught in abundance throughout lake Mistassini. Lake trout are taken weighing from four to forty pounds, brook trout up to six pounds, whitefish to fourteen and pike, pickerel, red and white suckers, and chub of correspondingly large size. These fisheries would prove of great value if access to them could be had by railway, as the supply is practically unlimited here and in the adjoining large lakes.

Fishing beyond cape Chidley (the western limit of Labrador), along the east coast of Ungava bay, was not undertaken until 1893, when a Newfoundland steamer was so successful that, in 1894, two steamers and three schooners made successful catches in the neighbourhood of Port Burwell. At first the Hudson's Bay Co. employed a small refrigerator steamer in this trade, and the frozen salmon were taken to London for sale. At that time the annual catch for export on Koksoak river averaged 100 tierces (small hogsheads), Whale river, 50 tierces, and George river, 120 tierces. Eventually, however, this mode of export was abandoned and the salmon were split and salted. In 1896 the salmon fishery was poor, the catch being far below the average and only equal to half the catch of the previous year. In 1897 the fishery was almost a total failure.

The west side of Ungava bay appears to be the western limit of the Atlantic salmon. As mentioned above the Arctic trout or Hearne salmon was also salted at Chimo and sent to London where it fetched nearly the same price as salted salmon. The white porpoise is also taken at Ungava on the Leaf river and at first the amount of oil so obtained was about 80 tierces of 40 gallons each. Latterly, however, this industry has been practically abandoned.

FURS

Foxes are the most numerous of the fur-bearing animals and are found throughout the barren and wooded country; they occur as to numbers in the following order: white, red, cross, black (silver) and blue. There appears to be a greater proportion of dark-coloured foxes in the northern region than in the southern. The fur of any animal is generally considered finer and thicker towards the northern and colder limit of its range but it is claimed that the carefully bred, more or less domesticated foxes of Prince Edward Island produce finer fur than their wild brethren.

Next to foxes, marten are the most numerous animals. The marten is one of the most abundant and valuable fur-bearing animals of Labrador. Its northern range is practically limited to the southern boundary of the semi-barrens, and it is found only in the wooded stretches of the river valleys north of this line; north of the Big and Hamilton rivers, it is rarely found.

The otter is common throughout the wooded region, and ranges northward into the barren grounds. They are very numerous on the upper Hamilton river, especially in the vicinity of the Grand fall, where a number of Indian families congregate in the spring to hunt them.

Beaver is common in the wooded regions and the semi-barrens where food is found. On the Hudson bay coast it is rare north of Fort George river. In 1887 a specimen was killed in Richmond gulf, latitude 56°. Charlton island, in James bay, was well stocked with beaver introduced by the Hudson's Bay Co., but they were totally exterminated by wandering Eskimos in 1890. Beaver are very plentiful on the lower Eastmain river. About Nichikun they are now more plentiful than formerly. They are common about the lower Hamilton river upwards to Sandgirt lake, becoming very rare to the north towards lake Mishikamau.

Mink are common in the lake Mistassini region, and ermine are found everywhere throughout the wooded regions. Other fur-bearing animals include lynx, fisher, bear, and wolverine.

WATER-POWERS

The interior of Ungava is a huge plateau which rises somewhat abruptly within a few miles of the coast line to heights of 500 to 6,000 feet. The various streams accordingly afford numerous water-powers. On Great Whale river, within twenty miles of the mouth there are three falls 150 feet, 230 feet and 65 feet respectively. A remarkable case of very high waterfalls in the interior is that of the Grand or M'Lean falls on Hamilton river situated some 300 miles from Rigolet. These falls were first viewed by a white man, John M'Lean in 1839.

The falls themselves have a sheer drop of 302 feet. In the data compiled by the Commission of Conservation the possibilities of horse-power of Grand Falls are based on a low-water drainage of 0.4 cubic feet per second per square mile of drainage area which is the quantity generally adopted under the climatic conditions of the country. Under these conditions the estimated horsepower of the falls would be 120,000 and of the total fall for a distance of twelve miles 300,000.

In connection with the future development of the mining and fishing industry and the fur trade the existence of a good harbour on James bay which would be the natural terminus of any railway projected, is of importance. It is situated at the mouth of Fort George river and is the only good harbour on James bay which, with a small amount of dredging, would afford capital accommodation for large vessels. A ship entering the river has to pass a few low islands lying off its mouth, but as there is good water and plenty of sea room between them, they occasion little danger. Within four miles from the mouth of the river a good harbour is formed by two rocky islands lying close to the north or main channel; this is called Stromness harbour, and, having a good anchorage, with plenty of water, well sheltered on all sides, is a convenient place to await a suitable state of the tide to enter the river.

APPENDIX V

Larger Water-Powers

The following table shows the location, ownership and turbine installation of the various developments of 1,000 horse-power or over in the province of Quebec. These total 1,073,086 horse-power and there is an additional 43,312 horse-power developed at smaller sites.

River	Location	Company	Installed Horse-Power
Batiscan	St. Genevieve	North Shore Power Co	1,600
Black	Waltham	Pembroke Electric Light Co.,Ltd.	3,600
Chaudiere	Levis	Quebec Power Co	4,800
Chaudiere	Lake Megantic	Lake Megantic Pulp Co	1,550
Chicoutimi	Chicoutimi	La Societe d'Energie Electrique du Saguenay	7,200
Chicoutimi	Chicoutimi	La Cie de Pulpe de Chicoutimi.	20,220
Chicoutimi	At mouth	Price Bros. & Co., Ltd	11,000
Du Sud	St. Raphael	La Corporation de Energy de Montmagny	2,400
Gordon Creek	Timiskaming	Kipawa Co., Ltd	7,200
Ha! Ha! Bay	Grande Baie	La Societe d'Energie Electrique du Saguenay	2,100
Jacques Cartier	Donnacona	Donnacona Paper Co., Ltd	6,000
Jacques Cartier	St. Gabriel	Quebec Power Co	2,200
Jacques Cartier	Pont Rouge	Donnacona Paper Co., Ltd	1,000
Jacques Cartier	Pont Rouge	Bird & Son, Ltd	1,384
Lievre	Buckingham	Jas. MacLaren Co., Ltd	8,125
Lievre	Buckingham	Electric Reduction Co	6,000
Lake Ouareau	Crabtree Mills	Howard Smith Paper Mills, Ltd.	1,200
Little Peribonka	St. Amedee de Peribonka	Quebec & Saguenay Pulp Co	1,500
Loup	River du Loup	Wolfe River Pulp & Paper Co., Ltd	3,160
Madeleine	Madeleine	Great Eastern Paper Co	5,000
Magog	Magog	Dominion Textile Co., Ltd	3,000
Magog	Rock Forest	City of Sherbrooke	3,000
Magog	Sherbrooke	City of Sherbrooke	2,700
Magog	Magog	Town of Magog	1,600
Magog	Sherbrooke	Southern Canada Power Co., Ltd.	4,050
Metis	Price	Lower St. Lawrence Power Co	3,500
Montmorency	St. Louis de Courville	Quebec Power Co	2,225
Montmorency	Montmorency	Quebec Power Co	5,400
Montmorency	Montmorency	Dominion Textile Co., Ltd	1,000
Murray	Murray Bay	Donahue Bros., Reg'd	9,000
Nicolet	Danville	Lotbiniere Lumber Co	1,680
North	Mont Rolland	Rolland Paper Co., Ltd	1,325
North	St. Jerome	J. C. Wilson, Ltd	2,290
North	Lachute	J. C. Wilson, Ltd	1,181
North	St. Jerome	Laurentian Hydro-Electric Ltd.	1,865
Ottawa	Hull	City of Hull	1,000
Ottawa	Deschenes	Hull Electric Co	3,195
Ottawa	Hull	Ottawa & Hull Power & Mfg. Co., Ltd	38,100
Ottawa	Hull	E. B. Eddy Co., Ltd	14,149
Ouiatchouaniche	Val Jalbert	La Cie de Pulpe de Chicoutimi	7,300
Richelieu	Chambly	Montreal Light, Heat & Power, Cons'l'd	21,600

River	Location	Company	Installed Horse-power
R. Au Sable	Jonquiere	Price Bros. & Co., Ltd	4,500
R. Au Sable	Kenogami	Price Bros. & Co., Ltd	26,200
R. Au Sable	Jonquiere	Town of Jonquiere	2,500
Rimouski	Rimouski	Price Bros. & Co., Ltd	3,150
Rouge	Bell Falls	Hawkesbury Electric Light & Power Co., Ltd	1,650
Rouge	Table Rock	Hawkesbury Electric Light & Power Co., Ltd	7,200
Ste. Anne	St. Raymond	News Pulp & Paper Co., Ltd	4,080
Ste. Anne	St. Fereol	Laurentian Power Co., Ltd	24,000
Ste. Marguerite	Clarke City	Gulf Pulp & Paper Co	10,900
St. Francis	East Angus	Brompton Pulp & Paper Co.,Ltd.	10,701
St. Francis	Bromptonville	Brompton Pulp & Paper Co., Ltd.	10,316
St. Francis	Drummondville	Southern Canada Power Co	7,500
St. Francis	Windsor	Canada Paper Co., Ltd	5,025
St. Francis	Weedon	City of Sherbrooke	4,700
St. Francis	D'Israeli	St. Francis Water Power Co	4,200
St. Lawrence	St. Timothee	Canadian Light & Power Co	30,400
St. Lawrence	Cedars	Montreal Light, Heat & Power, Cons'l'd	174,800
St. Lawrence	Cedars	Montreal Light, Heat & Power, Cons'l'd	16,050
St. Lawrence	Lachine	Montreal Light, Heat & Power, Cons'l'd	15,800
St. Lawrence	Valleyfield	Montreal Cottons, Ltd	8,800
St. Maurice	La Loutre Falls	Quebec Streams Commission	1,150
St. Maurice	La Tuque	Brown Corporation, Ltd	4,400
St. Maurice	Shawinigan	Shawinigan Water & Power Co., Ltd	261,735
St. Maurice	Shawinigan	Northern Aluminum Co	
St. Maurice	Shawinigan	Belgo Canadian Paper Co	
St. Maurice	Grand 'Mere	Laurentide Power Co	167,000
Shawinigan	Shawinigan	Electric Service Corp'n.	1,400
Shipshaw	Near mouth	Shipshaw Power Co., Ltd	10,800
Shipshaw	Chute aux Galets	Price Bros. & Co., Ltd	17,600
Yamaska	Farnham	Town of Farnham	1,130

Sources of Information

IN addition to the Natural Resources Intelligence Service of the Department of the Interior, Ottawa, Canada, information respecting the natural resources of the province of Quebec and the opportunities offered settlers, artisans, business men and capitalists may be had from the following official sources:

High Commissioner for Canada, Kinnaird House, Pall Mall East, London, S.W. 1, England.

Agent General for Quebec, 38 Kingsway, London, W.C. 2, England.

Superintendent of Immigration for Canada, 1 Regent St., London, S.W. 1, England.

Commissioner for Canada, 17 Boulevard des Capucines, Paris, France.

Useful information may also be obtained from the various Provincial Government departments at Quebec, Canada, more especially the Department of Lands and Forests, Department of Agriculture and the Department of Colonization, Mines and Fisheries.

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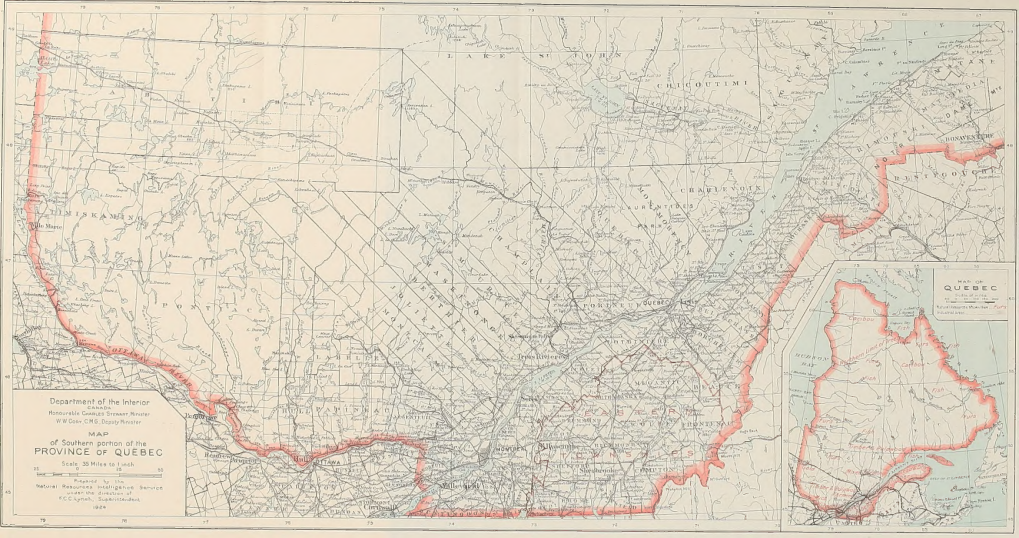
Department of the Interior
CANADA
Honourable Charles Stewart Minister
W W Cory C.M.G. Deputy Minister
MAP
of Southern portion of the
PROVINCE OF QUEBEC
Scale 28 Miles to 1 inch.
Prepared by the
Natural Resources Intelligence Service
under the direction of
R.C.S. Lynch, Superintendent
1924
LAKE ST JOHN
CHARLEVOIX
SAGUENAY
TEMISKAMING
PONTIAC
ABITIBI
LABELLE
MONTCALM
TERREBONNE
ARGENTEUIL
MISSISSIQUOI
BROME
SHEFFORD
STANSTEAD
COMPTON
WOLFE
MEGANTIC
DRUMMOND
NICOLET
YAMASKA
ST HYACINTHE
ROUVILLE
IBERVILLE
CHAMBLY
VERCHERES
MASKINONGE
BERTHIER
JOLIETTE
MONTMAGNY
BELLECHASSE
DORCHESTER
LOTBINIERE
MEGANTIC
ARTHABASKA
RICHMOND
WOLFE
GASPE
MATANE
RIMOUSKI
TEMISCOUATA
KAMOURASKA
MAP OF QUEBEC
Scale 28 Miles to 1 inch.
Ottawa
Montreal
Quebec
Three Rivers
Sherbrooke
Hull
Joliette
Valleyfield
Drummondville
Granby
St Hyacinthe
Rouyn
Amos
Roberval
Chicoutimi
Jonquiere
Arvida
Rimouski
Matane
Gaspe
Levis
Thetford Mines
Victoriaville
Farnham
Cowansville
Huntingdon
Beauharnois
Valleyfield
Hawkesbury
Lachute
Ste Agathe des Monts
Ste Anne de la Pocatiere
Riviere du Loup
Temiscouata
Edmundston
Grand Falls
Campbellton
Dalhousie
Bathurst
Newcastle
Chatham
Fredericton
Woodstock
Houlton
Presque Isle
Caribou
Madawaska
Grand Lake
Mattawamkeag
Millinocket
Lake Megantic
Sherbrooke
Coaticook
Magog
Knowlton
Waterloo
Granby
Shawinigan Falls
La Tuque
Mont Laurier
Maniwaki
Temiscaming
Cochrane
Kapuskasing
Timmins
Porcupine
Kirkland Lake
Haileybury
New Liskeard
North Bay
Sudbury
Sault Ste Marie
Algoma
Manitoulin Island
Georgian Bay
Lake Huron
Lake Superior
Lake Nipissing
Lake Temiscaming
Lake St John
Lake Megantic
Lake Memphremagog
Lake Champlain
Lake Ontario
Lake Erie
Lake St Francis
Lake St Louis
Lake St Peter
Lake of Two Mountains
Lake Timiskaming
Lake Abitibi
Lake Mistassini
Lake Kenogami
Lake Temiscouata
Lake Edward
Lake Metapedia
Lake Matapedia
Lake Mitis
Lake Matane
Lake Assametquagan
Lake Metis
Lake Matapedia
Lake Metapedia
Lake Temiscouata
Lake Edward
Lake Kenogami
Lake Mistassini
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Granby
Waterloo
Knowlton
Magog
Coaticook
Sherbrooke
Lake Megantic
Millinocket
Mattawamkeag
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Chatham
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Ste Anne de la Pocatiere
Ste Agathe des Monts
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Beauharnois
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Huntingdon
Cowansville
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Thetford Mines
Levis
Gaspe
Matane
Rimouski
Jonquiere
Arvida
Chicoutimi
Roberval
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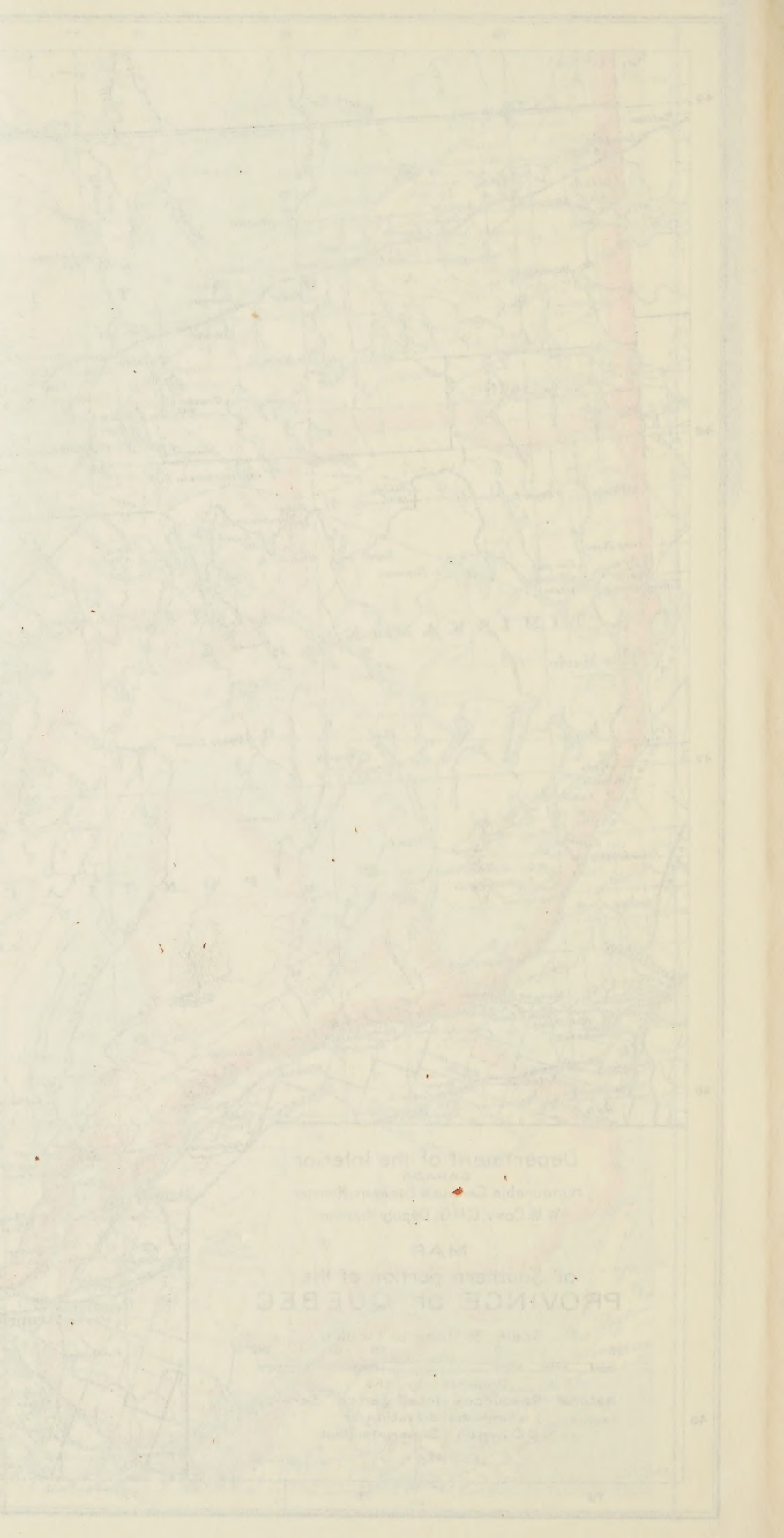
Rouyn
St Hyacinthe
Granby
Drummondville
Valleyfield
Joliette
Hull
Sherbrooke
Three Rivers
Quebec
Montreal
Ottawa



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Information About Canada

FOR information concerning Canadian natural resources write to the Natural Resources Intelligence Service, Department of the Interior, Ottawa, Canada.

It is a branch of one of the departments of the Government of Canada and its function is to supply, authentic information on the natural resources of Canada to all who are interested in them and in the problems associated with their development. In pursuance of this object it issues numerous reports, maps and charts, a list of which may be had on application.

It will assist materially if applicants will state their needs as clearly and in as detailed a form as possible. Often there is important unpublished information on file which can be furnished only when the wants of the inquirer are fully known.

NATURAL RESOURCES INTELLIGENCE SERVICE
DEPARTMENT OF THE INTERIOR
OTTAWA :: CANADA